GV-S50

SERVICE MANUAL

US Model
Canadian Model

VIDEO WALKMAN

A MECHANISM

SPECIFICATIONS

GV-S50

System

Video recording system	Rotary two-head helical scanning FM system
Audio recording system	Rotary head, FM stereo system
Video signal	EIA standard, NTSC color
Usable cassettes	8 mm video format cassettes
Tape speed	SP: approx. 1.43 cm/sec. LP: approx. 0.72 cm/sec.
Recording time	SP mode: 2 hours LP mode: 4 hours (with Sony P6-120 cassette)
Playback time	SP mode: 2 hours LP mode: 4 hours (with Sony P6-120 cassette)
Fast forward/rewinding time	Approx. 8 minutes (with Sony P6-120 cassette)

LCD section

Picture	4 inches measured diagonally 8.2 x 6.2 cm ($3^{1}/_{4}$ x $2^{1}/_{2}$ inches)
On-screen display	TN LCD/TFT active matrix method Total dot number: 89,856 (384 x 234)

Inputs/outputs

VIDEO/AUDIO IN/OUT	Selectable automatically according to the operation
Video input	Phono jack, 1 Vp-p, 75 ohms, unbalanced, sync negative
Video output	Phono jack, 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio input	Phono jack, –7.5 dBs (0 dBs=0.775 Vrms), input impedance more than 47 kilohms
Audio output	Phono jack, –7.5 dBs (330 mV) at load impedance 47 kilohms, output impedance less than 10 kilohms
Speaker	7.2 ohms, 200 mW
Phones	Minijack, 8 ohms
ⅽ REMOTE (LANC)	Stereo mini-minijack

General

Power requirements	Battery mounting surface input: 6.0 V (battery pack), 7.5 V (AC power adaptor), 6.5 V (DC pack DCP-77)
Power consumption	6.7 W (for continuous playback)
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to 60°C (–4°F to 140°F)
Dimensions	148.5 x 83 x 127 mm (w/h/d) ($5^{7}/_{8}$ x $3^{3}/_{8}$ x 5 inches)
Weight	Approx. 980 g (2 lb 3 oz) not including battery pack
Accessories supplied	Tuner timer unit TGV-3 (1) Battery pack NP-55H (1) AC power adaptor AC-S10 (1) Stereo earphones (1) Signal splitter (1) Lithium battery CR2032 (1)

AC-S10

Power consumption	20 W
Power requirements	100-240 V AC, 50/60 Hz
Output voltage	DC OUT: 7.5 V, 1.6 A in operating mode
Battery charge terminal:	10 V, 1.3 A in charge mode
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to 140°F)
Dimensions	Approx. 72 x 39 x 141 mm (w/h/d) ($2^{7}/_{8}$ x $1^{9}/_{16}$ x $5^{5}/_{8}$ inches) including projecting parts and controls
Weight	Approx. 330 g (12 oz.)

Design and specifications are subject to change without notice.

— Continued on next page —

8 VIDEO RECORDER/MONITOR

SONY®

MICROFILM

List of Recommended Accessories

	Model Name	Page
Battery pack	NP-77HD, NP-77H, or NP-66H	13
Battery charger	BC-S10 or BC-77	13
Car battery charger	DC-S10	17
DC pack	DCP-77	17
Connecting cord	VMC-910S/920S (1 m/2 m)	30, 32, 34, 35, 36, 37
Cleaning cassette	V8-25CLH	38

TGV-3

Tuner section

Channel coverage	VHF: 2–13 channels UHF: 14–69 channels Cable TV channels: (A-8–A-6), (A-2–W), (W+30–W+84)
Antenna input	75-ohm minijack for VHF/UHF

Timer section

Clock	Crystal lock
Time indication	12-hour cycle
Timer setting	Only for recording, 6 events/month

General

Power requirements	Power is supplied from the GV-S50 video recorder/monitor.
Power consumption	1.3 W
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to 60°C (–4°F to 140°F)
Dimensions	34.5 × 64.5 × 121.5 mm (w/h/d) ($1\,^{3}/_{8} \times 2\,^{5}/_{8} \times 4\,^{7}/_{8}$ inches)
Mass	Approx. 170 g (6 oz)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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SECTION 1
GENERAL

This section is extracted from GV-S50 instruction manual.

1-1. GV-S50

Precautions

- Operate the unit on 6.0 V (battery pack)/7.5 V (AC power adaptor)/6.5 V (DC pack DCP-77).
- Do not operate the unit where the temperature is below 0°C (32°F) or above 40°C (104°F).
- For DC or AC power supply, use the accessories supplied or recommended in this manual.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Avoid rough handling or mechanical shock to the unit.
- Do not apply excessive force to the LCD (Liquid Crystal Display).
- Remove and store video cassettes after recording or playback.
- Do not wrap up the unit and operate it because heat may build up internally.
- Avoid using and storing the unit in the following locations:
  - –susceptible to vibration
  - –exposed to strong magnetic fields
  - –near TV or radio transmitters where strong radio waves are generated
  - –on the sand

Preliminary

Overview of the GV-S50

The Video Walkman GV-S50 is an 8 mm video recorder/monitor with a 4-inch LCD (Liquid Crystal Display). Its compact and lightweight design allows you to play back video tapes anywhere and any time you like.

Only with this video recorder/monitor, you can watch playback pictures of 8 mm video tapes, but, with the supplied TGV-3 tuner timer unit installed, you can watch and record TV programs anywhere and anytime you like.

A variety of optional accessories or equipment allows you to make the best use of the GV-S50.
- By connecting another VCR, you can edit video tapes.
- By connecting a video camera recorder (not supplied), you can use this unit as a monitor, and play back the recorded pictures immediately.

Features

- **Easy-to-use Menu screen**
- **AFM Hi-fi stereo for high quality sound***
- **CRYSTAL-CLEAR still/slow picture on LCD**
- **MEGABASS circuit for dynamic bass sound**
- **Playback of tapes recorded in Hi8 video system****
- **Remaining battery capacity indication**
  Shows you the remaining capacity of the battery.
- **REMOTE terminal**
  Allows remote control of this unit by other Sony video equipment.

The GV-S50 uses 8 mm video format cassettes. It records in SP mode (approximately 1.43 cm/second) and LP mode (Approximately 0.72 cm/second) and can play back in SP and LP modes. The quality of the playback picture in LP mode, however, will not be as good as that in SP mode.

PCM (Pulse Code Modulation) recording/playback, that is, digital recording/playback, is not possible with this unit. The PCM sound recorded with another recorder cannot be played back with this unit.

For using this unit abroad, see page 39.

*** AFM Hi-fi Stereo System**

On the 8 mm video standard track, the sound is recorded/played back in AFM Hi-fi monaural. The PCM digital stereo sound is recorded/played back on the PCM track as an option. With this unit, AFM Hi-fi stereo sound can be recorded on the standard track.
To maintain compatibility with the conventional AFM Hi-fi monaural equipment, the AFM Hi-fi stereo sound is recorded as L – R sound using the 1.7 MHz carrier and L + R sound using the 1.5 MHz carrier as the FM audio signal.
To playback the tape recorded by its AFM Hi-fi stereo system, this unit uses a matrix circuit to produce the L and R stereo sounds separately. When conventional Hi-fi monaural equipment is used to play back a tape recorded in AFM Hi-fi stereo, it will produce the L + R monaural sound because it can reproduce only the 1.5 MHz carrier.
The AFM Hi-fi stereo system of this unit provides a live stereo sound atmosphere even when using the 8 mm video standard track.

**** Hi8 playback**

Playback of tapes recorded in SP mode of Hi8 video system is possible on this unit.
- Recording in Hi8 video system is impossible.
- Playback of tapes recorded in LP mode of Hi8 system is impossible.
- High resolution which a conventional Hi8 VCR give the picture cannot be obtained.
- Noise may appear on the screen during playback.

Menu Screen

You can perform certain operations by selecting them from the menu screen.
The menu appears on the screen when you press MENU. Select the desired item on the menu screen.
For more details, see reference pages in the tables below.

Menu screen

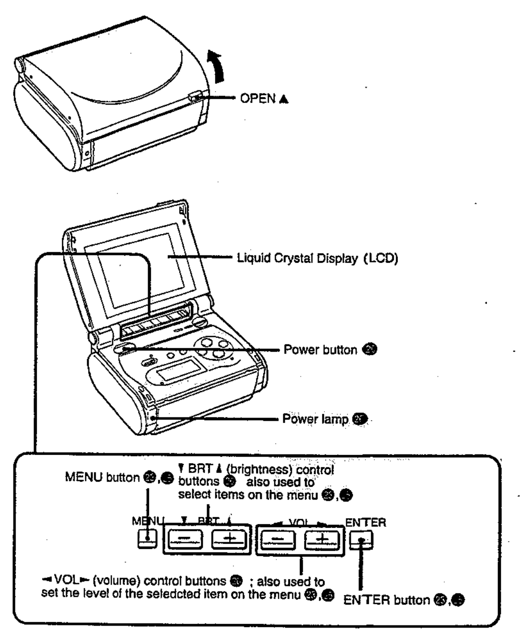
Menu item	Setting purpose	Reference page
SOUND	To obtain dynamic bass sound	21, 25–26, 28, 30, 32
REC MODE	To select the tape speed (SP or LP)	25–26, 28, 30, 32
HUE	To adjust tints	23, 25–26
COLOR	To adjust the depth of colors	23, 25–26
SLOW TRACKING	To adjust the tracking for still picture or slow picture search	22, 25–26

Location of Parts and Controls

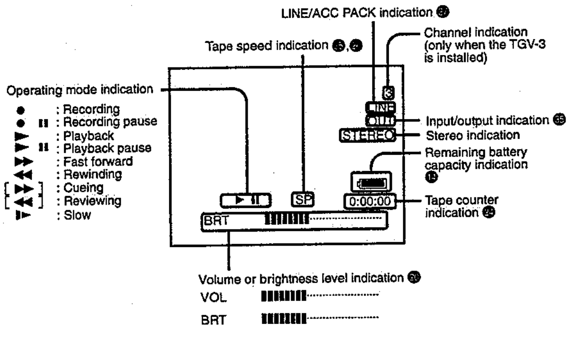
For details, refer to the pages indicated in circles.

Parts and Controls for Adjusting the LCD and for Using the Menu Screen

Push OPEN ▲ and pull up the display first.

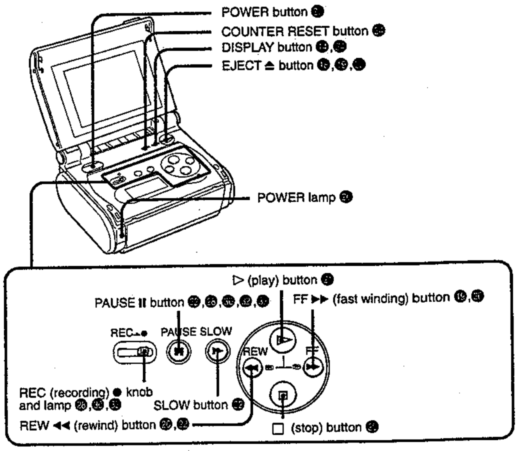

OPEN ▲
Liquid Crystal Display (LCD)
Power button ⑳
Power lamp ⑳
MENU button ㉓,㉕
▼BRT▲ (brightness) control buttons ㉒ also used to select items on the menu ㉓,㉕
MENU
▼ BRT ▲
◄ VOL ►
ENTER
◄VOL► (volume) control buttons ㉒ ; also used to set the level of the seledcted item on the menu ㉓,㉕
ENTER button ㉓,㉕

On-Screen Displays

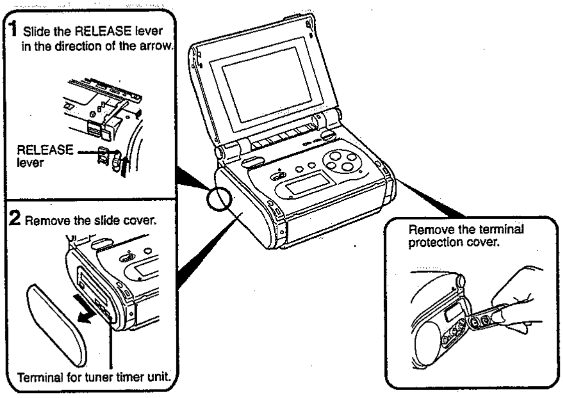

LINE/ACC PACK indication ㊲
Tape speed indication ⑮,㉔
Channel indication (only when the TGV-3 is installed)
Operating mode indication
● : Recording
● ❚❚ : Recording pause
▶ : Playback
▶ ❚❚ : Playback pause
▶▶ : Fast forward
◀◀ : Rewinding
[▶▶] : Cueing
[◀◀] : Reviewing
❚▶ : Slow
3
LINE
OUT
STEREO
Input/output indication ㉟
Stereo indication
Remaining battery capacity indication ⑮
▶ ❚❚
SP
0:00:00
Tape counter indication ㉕
BRT
Volume or brightness level indication ㉚
VOL
BRT

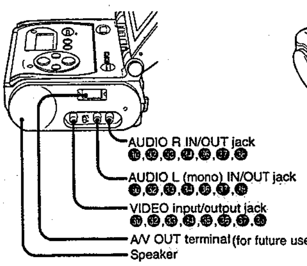
Note
All indications are illustrated as if they were actually displayed at the same time; however some of them are not displayed at the same time.

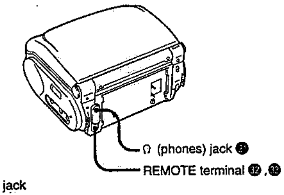
Parts and Controls for Playback and Recording


POWER button ⑳
COUNTER RESET button ㉕
DISPLAY button ㉑,㉒
EJECT ≜ button ⑯,⑲,㉔
POWER lamp ㉑
▷ (play) button ⑳
PAUSE ❚❚ button ㉒,㉖,㉛,㉜,㉝
FF ▶▶ (fast winding) button ⑲,㉑
REC ●
PAUSE
SLOW
REW
FF
REC (recording) ● knob and lamp ㉖,㉚,㉝
SLOW button ㉒
REW ◀◀ (rewind) button ⑳,㉒
☐ (stop) button ㉑

Parts for Connections


1 Slide the RELEASE lever in the direction of the arrow.
RELEASE lever
2 Remove the slide cover.
Terminal for tuner timer unit.
Remove the terminal protection cover.

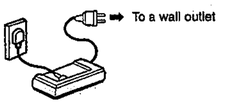
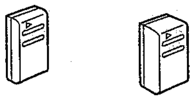
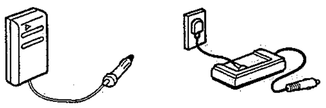

AUDIO R IN/OUT jack ㉚,㉜,㉝,㉞,㉟,㊲,㊳
AUDIO L (mono) IN/OUT jack ㉚,㉜,㉝,㉞,㉟,㊲,㊳
VIDEO input/output jack ㉚,㉜,㉝,㉞,㉟,㊱,㊲,㊳
A/V OUT terminal (for future use)
Speaker


Ω (phones) jack ㉑
REMOTE terminal ㉜,㉝

Getting Started

Power Sources

You can select the best power source for your own needs.

Place	Power source	Page
Indoors	AC power adaptor AC-S10 (supplied)  To a wall outlet	12
Outdoors	Battery pack NP-55H (supplied) NP-66H, NP-77HD or NP-77H  NP-55H NP-77H	13
In a car	DC pack DCP-77 or Car battery charger/adaptor DC-S10 	17

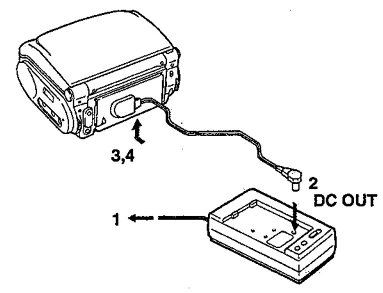
Only the AC-S10 and the NP-55H are supplied; the other accessories for your special needs are available from your Sony dealer.

Disconnecting the power source during recording or playback operations may damage the inserted cassette tape. If this should happen, supply power again immediately and turn on the power.

Power Sources

Using a Wall Outlet for Indoor Use

Use the supplied AC-S10 AC power adaptor.



1 **Plug in the AC power adaptor to a wall outlet.**
The POWER lamp (green) on the AC-S10 lights up and the power turns on.

2 **Insert one end of the connecting cord (supplied with the AC-S10) into the DC OUT jack of the AC-S10.**

3 **Align the upper side edge of the connecting plate with the white line printed on the video recorder/monitor so that the slots of the connecting plate (the other end of the connecting cord) are postitioned over the tabs of the battery mounting surface.**

4 **Press the connecting plate and slide it in the direction of the ▶ mark.**

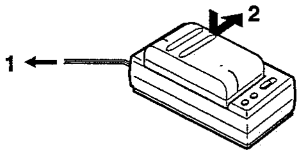
To remove the connecting plate
Slide out the connecting plate while sliding the BATT release knob.

CAUTION
TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

- The unit is not disconnected from the AC power source as long as it is connected to a wall outlet.
- One blade of the plug is wider than the other for the purpose of safety and will fit into a wall outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.

Using a Battery Pack for Outdoor Use

To charge a battery pack
Before using a battery pack, make sure to charge it first even if it is newly purchased. Beside the supplied NP-55H battery pack, optional NP-66H, NP-77HD and NP-77H battery packs, as described on page 11, are available.
Use the supplied AC-S10 AC power adaptor to charge a battery pack.



1 **Plug in the AC power adaptor to a wall outlet.**
The POWER lamp (green) on the AC-S10 lights up and the power turns on.

2 **Install the battery pack in the AC-S10.**
Align the flat side of the battery pack with the line on the AC-S10. Then push down and slide the battery pack in the direction of the arrow. The REFRESH lamp (red) lights up first and then it goes out. When the CHARGE lamp (orange) lights up, battery charging begins. When the battery is charged, the CHARGE lamp goes out. Unplug the AC power adaptor and the POWER lamp goes out. (Refer to the instructions provided for the AC-S10 as well.)

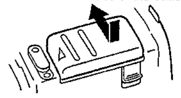
Required charging time:

NP-55H (supplied)	NP-66H	NP-77H	NP-77HD
70 min.	100 min.	140 min.	140 min.

(Approx. minutes using AC-S10)

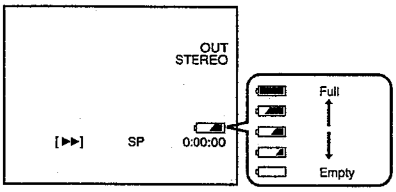
- The battery pack cannot be charged when using the AC power adaptor is used to operate the unit.
- An NP-55H, NP-66H, NP-77HD and NP-77H battery pack can also be charged with the BC-S10 or BC-77 battery charger.

To attach a battery pack to this unit
Align the upper side edge of the battery with the white line printed on the video recorder/monitor so that the slots of the battery are positioned over the tabs of the battery mounting surface, and slide the battery pack while pressing it.



Power Source

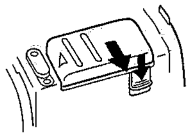
To check the remaining battery capacity
When a battery pack is installed, press DISPLAY to show on the screen the remaining battery capacity as well as other indications (see page 8 for other indications).
To cancel this display, press DISPLAY again.



A fully-charged battery pack lasts for:

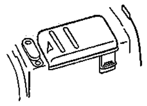
	NP-55H	NP-66H	NP-77H	NP-77HD
Playback (with TGV-3 connected)	Approx. 50 min.	Approx. 75 min.	Approx. 100 min.	Approx. 100 min.
Recording (without TGV-3 connected)	Approx. 60 min.	Approx. 90 min.	Approx. 120 min.	Approx. 120 min.
Watching TV programs	Approx. 60 min.	Approx. 90 min.	Apprpx. 120 min.	Approx 120 min.
Recording TV programs	Approx 50 min.	Approx. 75 min.	Approx. 100 min.	Approx. 100 min.

To remove the battery pack
While sliding the BATT release knob in the direction of the arrow, slide out the battery pack as illustrated.

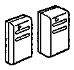


Note
If you use the NP-77HD battery pack which has the battery life indicator, the remaining battery capacity indicated on the LCD may be different from that indiacted by the NP-77HD battery pack. The indicator on the NP-77HD battery pack is more accurate.

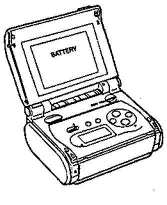
Using the Battery Pack Efficiently



Preparing battery packs
Prepare 2 or 3 times more battery power than you plan to use.
The published battery capacity is measured in a continuously playing VCR at room temperature starting with a fully charged battery. Fast winding or rewinding uses much power than normal playing. Consequently, battery consumption becomes faster when these operations are performed frequently.



Battery consumption is faster in a cold climate
Cold climates reduce the efficiency of a battery and cause it to run out more quickly.



When to replace battery packs
When a battery pack is fully discharged, the POWER lamp starts blinking slowly. During recording, "BATTERY" also starts lighting on the screen. Replace the battery when the POWER lamp starts blinking rapidly.
Turn off the video recorder/monitor power before replacing the battery. Especially during recording, keep the cassette inside the cassette holder while replacing the battery. When a fresh battery is attached, recording can be resumed smoothly without any picture distortion.

Notes on charging
Before using a battery pack, charge it fully. A newly purchased battery pack also needs to be charged before its first use.

Recharge a battery pack only when it is fully used out
Avoid recharging only partly used battery packs. Repeated charging of partly discharged battery packs reduces their capacity and shortens their overall life span. The original capacity can sometimes be recovered by fully discharging and then fully recharging the battery pack.

Power Source

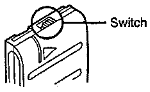
Rechargeable battery packs

Battery pack care

- Remove the battery pack from the video recorder/monitor after use, and keep it in a cool place. When the battery pack is installed on a video recorder/monitor, a small amount of current flows to the recorder even if the POWER switch is turned off. This causes overdischarge and so shortens battery life.
- The battery pack is always discharging a little even when not in use. Thus, the battery should be charged before each use.
- If the terminals (metal parts on the back) are dirty, the battery capacity will be reduced. When the terminals are dirty, or when the battery pack has not been used for a long time, attach and remove it several times. This will improve the contact between the battery pack and the video recorder/monitor. Also, wipe the + and - terminals with a soft cloth or paper.
- If the battery pack is not used for a long time (about 1 year) and you charge it again, the battery capacity will be reduced. After several charging and discharging cycles, the battery will recover its original capacity.

How to use the switch on the battery pack

Use this switch as a reminder of charging.
Set the switch to the no-marked position when the charging is completed.
Set the switch to the red-marked position when the battery is discharged.



Battery life

A battery can be fully charged and discharged about 500 times under normal temperatures. If "BATTERY" appears just after turning on the recorder, even though a fully charged battery pack has been installed, replace the battery pack with a new one.

Best temperature for charging

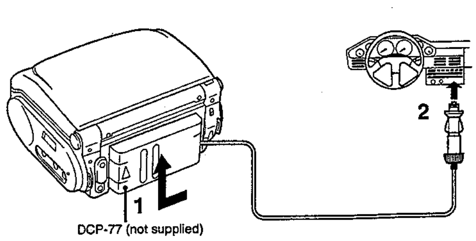
A lower temperature requires a longer charging time.
Charging under a temperature ranging from 10°C to 30°C (50°F to 86°F) is recommended.

Why a battery pack heats up

While a battery pack is being charged or used, the chemical change occurring inside the battery pack release heat. The battery pack becomes warm, but this is normal and not dangerous.

Warning
If the + and - terminals are short-circuited with a piece of metal, the battery heats up abnormally. This is very dangerous. Never put an uncovered battery pack in a pocket together with a key holder or other metals .

Using a Car Battery



1 **Attach the DC pack to the video recorder/monitor by aligning the upper side edge of the DC pack with the white line on the video recorder/monitor and slide the DC pack in the direction of the ▶ mark while pressing it.**

2 **Plug the power cord into the cigarette lighter socket.**

- Only connect the DCP-77 to a car with a negative ground 12 V or 24 V battery.
- The DCP-55 is not recommended for this unit because its power is not enough to operate this unit.

Notes

- Be careful not to let any metal object touch the metal projection on the battery pack. When the battery pack is not in use, keep it in its case.
- Keep the video recorder/monitor away from any power source. Such sources may cause noise to appear on the screen.

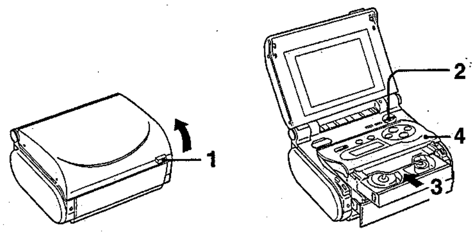
Cautions on using this unit in a car

- For your safety, do not watch video tapes or operate the controls while driving.
- Avoid leaving the unit in a place with very high temperatures. If you do, it may cause distortion of the cabinet or malfunction of the unit.
- If you use this unit while the car engine is stopped, the car battery will be discharged. Avoid running this unit from the car battery more than 12 hours without recharging it.
- Remove the car battery cord from the cigarette lighter socket if you do not use the unit for a long time.

Playing Back Tapes

Make sure that the power source is attached to this unit.

Inserting a Cassette



1 **Push OPEN ▲ and open the display.**

2 **Press EJECT ⏏.**
The cassette holder opens automatically.
Do not open the cassette holder forcibly.

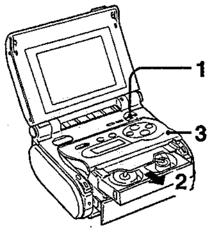
EJECT

3 **Insert a cassette with the window side facing up.**

4 **Press the PUSH mark.**
The cassette holder closes automatically.

When you press EJECT ⏏, power is supplied and the cassette holder opens even if the power is turned off. After the cassette holder opens, the power goes off automatically. Press POWER if you want to continue the operation.

Ejecting a Cassette



1 **Press EJECT ⏏.**
Make sure the tape is not running.

EJECT

2 **Remove the cassette.**

3 **Press the PUSH mark.**
The cassette holder closes automatically.

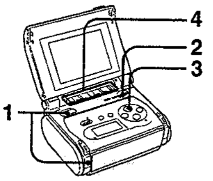
Notes on opening and closing the cassette holder

- Do not insert your finger into the cabinet while the cassette holder is open.
- Be careful not to get your finger caught in the cassette holder.

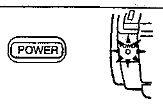
Cassette care

- Store cassettes in their cases when they are not in use and keep them in an upright position to keep out dust and prevent uneven winding.
- Never insert a cassette upside down into the cassette holder.
- Never cover the small holes on the rear of a cassette or insert anything into the holes.
- Remove a cassette from the video recorder/monitor when it is not in use.

Watching Video Tapes



1 **Press POWER.**
The POWER lamp lights.

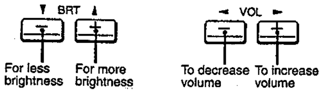


2 **Insert a recorded tape as explained on page 18.**

EJECT

3 **Press ▷ (play).**
Playback starts.

4 **Press BRT – or + and VOL – or + to adjust the brightness and the volume respectively.**
The volume and brightness level indication bars appear on the screen.


▼ BRT ▲
◄ VOL ►
For less brightness
For more brightness
To decrease volume
To increase volume

To stop playback	To rewind the tape	To advance the tape
Press ☐ (stop).	Press REW ◄◄.	Press FF ►►.

If power supply is interrupted
The levels of volume and brightness are automatically set to the center point on the level indication bars on the screen.

To turn off the power to this unit

Press POWER again so that the POWER lamp goes off.

To rewind the tape and play it back automatically — Auto play

Press ▷ (play) while pressing REW ◄◄.

To mute the picture and sound

Close the LCD so that the LCD turns off and that sounds are not heard from the speaker.
To restore the picture and sound, push OPEN ▲ and pull the LCD up.

For private listening in stereo

Connect the supplied stereo earphones to the ∩ (phones) jack. No sound will be heard from the speaker.

Listening to Stereo and Dynamic Bass (MEGABASS) Sound

You can listen to dynamic bass sound in stereo by using the supplied stereo earphones; however, you cannot listen to this sound though the speaker.

Relation between outputs and sound effects

	Stereo effect	MEGABASS effect
Earphones	Active	Active
Speaker	Inactive	Inactive
Line output	Active	Inactive

To activate MEGABASS Sound

Select "MEGABASS" from "SOUND" on the menu screen. For details on the procedure, see pages 25 and 26.

To inactivate MEGABASS, select "NORMAL" from "SOUND" on the menu screen.

Various Playback Modes

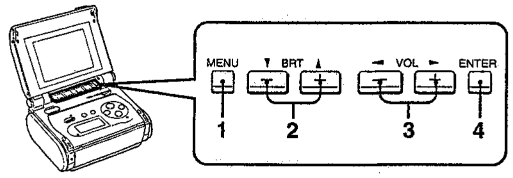
To stop the tape for a moment — Still picture	During playback PAUSE (II) ▶ II	To resume normal playback, press ▷ or PAUSE II. This mode will be automatically released and the unit will stop after five minutes.
To view the slow playback picture	During playback SLOW (I▶) ▶	To resume normal playback, press ▷. (or normal playback resumes automatically after one minute.)
To locate a particular point while viewing the picture — Picture search	During playback REW (◄◄) [◄◄] During playback FF (►►) [►►]	When you release the button, the unit will return to the previous mode.
To view the picture at high speed — FR picture search	During rewinding REW (◄◄) [◄◄] During forwarding FF (►►) [►►]	

If streaks appear in slow playback pictures on LCD
Adjust the pictures during slow playback, by using the menu screen, so that streaks disappear from the pictures. For details on the procedure to adjust "SLOW TRACKING" on the menu screen, see pages 25 and 26.

When the playback picture is viewed on another TV or monitor
The pictures may possibly become black and white or shakes vertically in picture search and FR picture search modes. Moreover, noise appears in the still and slow pictures.

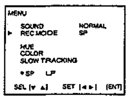
Adjusting the Picture

You can adjust tints and the depth of colors on the menu screen.

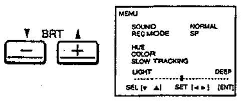

MENU
▼ BRT ▲
◄ VOL ►
ENTER
1
2
3
4

1 **Press MENU.**
The menu screen appears.

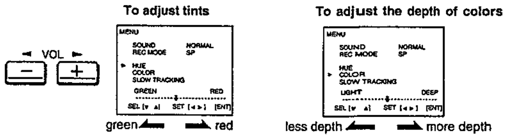
MENU


MENU
SOUND NORMAL
► REC MODE SP
HUE
COLOR
SLOW TRACKING
•SP LP
SEL [▼ ▲] SET [◄ ►] [ENT]

2 **Press ▼ or ▲ to select the item to adjust.**


▼ BRT ▲
MENU
SOUND NORMAL
REC MODE SP
HUE
COLOR
SLOW TRACKING
LIGHT DEEP
SEL [▼ ▲] SET [◄ ►] [ENT]

3 **Press ◄ or ► to make adjustments.**
Each time you press ◄ or ►, the selected item is adjusted as shown below.

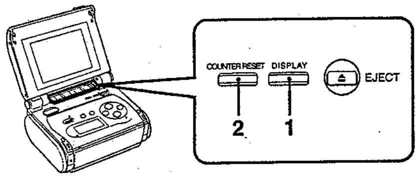

◄ VOL ►
To adjust tints
MENU
SOUND NORMAL
REC MODE SP
► HUE
COLOR
SLOW TRACKING
GREEN RED
SEL [▼ ▲] SET [◄ ►] [ENT]
green
red
To adjust the depth of colors
MENU
SOUND NORMAL
REC MODE SP
HUE
► COLOR
SLOW TRACKING
LIGHT DEEP
SEL [▼ ▲] SET [◄ ►] [ENT]
less depth
more depth

4 **Press ENTER.**

ENTER

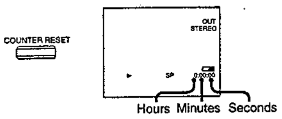
Using the Tape Counter

The counter indicates the tape transport in hours, minutes and seconds.
During playback or recording, it shows you the playback or recording time.


COUNTER RESET
DISPLAY
EJECT
2
1

1 **Press DISPLAY.**
The tape counter appears on the screen.

2 **Press COUNTER RESET during playback or recording at the point you want to locate later.**
The counter is reset to 0:00:00.

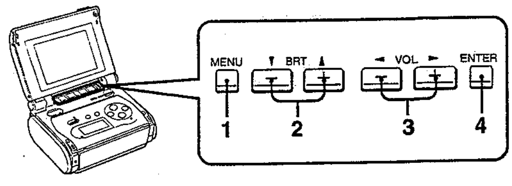

COUNTER RESET
OUT
STEREO
SP
0:00:00
Hours
Minutes
Seconds

Notes
- When you play back a blank tape, the tape counter does not function.
- The counter reading and the point on the tape may not correspond exactly. Use the counter as a guide.
- The difference between the counter reading and the point on the tape may increase by several seconds in the following cases:
  - after repeated fast-forward and rewinding
  - when playing back a tape recorded both in SP and LP modes
  - when playing back a tape having a blank portion between recorded portions

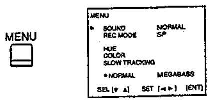
Settings on the Menu Screen

You can set five items on the menu screen. You can use this unit with the settings preset at the factory (indicated by ● in the list on page 26).
If you want to change the settings, follow the procedure described below.

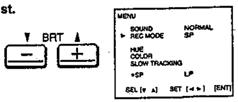
Operation


MENU
▼ BRT ▲
◄ VOL ►
ENTER
1
2
3
4

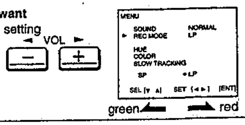
1 **Press MENU.**
The menu screen appears.


MENU
MENU
SOUND NORMAL
REC MODE SP
HUE
COLOR
SLOW TRACKING
•NORMAL MEGABASS
SEL [▼ ▲] SET [◄ ►] [ENT]

2 **Press ▼ or ▲ to select the item to adjust.**


▼ BRT ▲
MENU
SOUND NORMAL
REC MODE SP
HUE
COLOR
SLOW TRACKING
•SP LP
SEL [▼ ▲] SET [◄ ►] [ENT]

3 **Press ◄ or ► to select the setting you want**
Each time you press ◄ or ►, the selected setting changes and is indicated by ● .


◄ VOL ►
MENU
SOUND NORMAL
REC MODE LP
HUE
COLOR
SLOW TRACKING
SP •LP
SEL [▼ ▲] SET [◄ ►] [ENT]
green
red

4 **Press ENTER.**

Note
You cannot cancel the setting procedure once you start changing the setting.

Menu Screen List

Items	Settings	Setting purpose	When to use
SOUND	● NORMAL	To inactivate the MEGABASS effect	
	MEGABASS	To emphasize bass sound	When emphasizing bass sound
REC MODE	● SP	To record at normal speed	When recording
	LP	To record at double normal speed	
HUE	Level indication bar*	To adjust tints	When the colors of picture are strange
COLOR	Level indication bar*	To adjust the depth of color	
SLOW TRACKING	Level indication bar*	To adjust the tracking for slow motion playback picture	When watching slow motion pictures

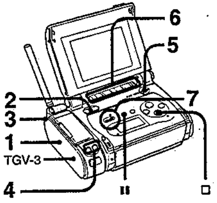
●: factory setting
* Levels are set at the middle of the bar at the factory.

Operations with other equipment

Recording a TV program

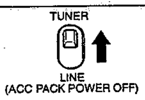
You cannot watch or record a TV program on this unit since this unit does not have a built-in tuner. However, if you install the supplied TGV-3 tuner timer unit to this unit, you can watch and record a TV program.
Here's only explanation of how to record a TV program after connecting the tuner to this unit. For installation, channel preset, channel selection, etc., refer to the instruction manuals supplied with the TGV-3.

Operation


6
5
2
3
1
TGV-3
4
7
II
□

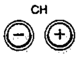
1 **Install the TGV-3 tuner timer unit to this unit, and carry out the necessary setting, such as channel preset, on the TGV-3. (For more details, refer to the instruction manual supplied with the TGV-3.)**

2 **Set the TUNER/LINE selector on the rear of the TGV-3 to TUNER.**

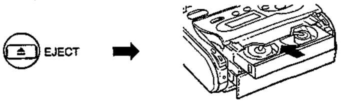

TUNER
LINE
(ACC PACK POWER OFF)

3 **Turn on the power of this unit**
"ACC PACK" appears on the screen for several seconds.

4 **Press CH –/+ on the TGV-3 to select the TV program to be recorded.**

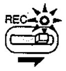


5 **Insert a cassette as explained on page 18.**



6 **Select the tape speed ("SP" or "LP" from "REC MODE") on the menu screen of this unit.**
See "Settings on the Menu Screen" on pages 25 and 26.

7 **Slide REC on this unit in the direction of the arrow.**
Recording starts.



To pause recording
Press PAUSE ⏸.

To resume recording
Press PAUSE ⏸ again.
If you do not press PAUSE ⏸ again within five minutes, the pause mode will be released automatically and the unit will stop.

To stop recording
Press □ (stop).

When changing the channel while recording
Set this unit in recording pause mode and then select another channel. You cannot watch another program while recording.

When recording from the beginning of the tape
Advance the tape for about 15 seconds before recording. This will prevent missing the starting point when playing back on another VCR.

When the tape is recorded to the end
The tape stops automatically, but the unit is not turned off. If you are not going to continue operation, turn off the power by pressing POWER.

About recorded sound
Recording level is always fixed automatically.
The VOL – and + have no effect on the recorded sound level.

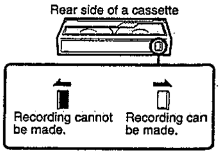
If power supply is interrupted while recording
Recording stops.

Recording/playback time
Two tape speeds (SP/LP) can be selected on the menu screen (see pages 25 and 26).
The recording time in LP mode is twice as long as that in SP mode. For better picture and sound, recording in SP mode is recommended. During playback, the mode in which the tape has been recorded is selected automatically.

Difference in color systems
There are different formats of the TV color broadcast and electricity system: NTSC, PAL and SECAM. Video cassette tapes are made to correspond to one of these formats. Use NTSC format cassette tapes for this unit. You will find "P6" on the package of NTSC cassettes.

To prevent accidental erasure
Slide out the tab on the back of the cassette so that red color is visible.

To re-record on the cassette, slide the tab back.



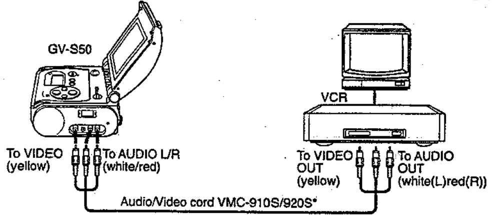
Note
If you record, using this unit, on a tape that has been recorded with PCM sound, and then if you play back this tape on a VCR with PCM function, the sound may be cut off occasionally. If this happens, set the audio monitor switch of the VCR to the standard position.

Editing Tapes

You can not record a TV program since this unit does not have a built-in tuner. However, you can edit a tape with the another VCR (8 mm, Beta, or VHS format) connected through the VIDEO/AUDIO input/output jacks of this unit.

Editing from Another VCR

Connection



* If the other VCR is monaural type, use the VMC-910MS or VMC-920MS (not supplied).

Operation

1 **Turn on the power of both units.**

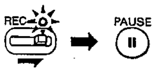
2 **Insert a source tape into the other unit (playback) and a tape for recording into this unit (recording).**
If the supplied TVG-3 tuner timer unit is installed, set the TUNER/LINE selector to LINE.

3 **Select the tape speed ("SP" or "LP" from "REC MODE") on menu screen of this unit.**
See "Settings on the Menu Screen" on pages 25 and 26.

4 **Activate the EDIT function* if it is provided with the other unit.**

5 **Locate the playback start point and press the pause button on the other unit.**

6 **Slide REC in the direction of the arrow and press PAUSE ⏸ on this unit.**
This unit is now put in recording pause mode.



7 **Press the pause buttons (PAUSE ⏸ on this unit) on both units to release the pauses.**

8 **Press the pause buttons on both units to pause the units again.**

9 **Repeat steps 7 and 8 to edit more scenes.**

10 **After editing is completed, press the stop buttons (□ on this unit) on both units to stop playback and recording.**

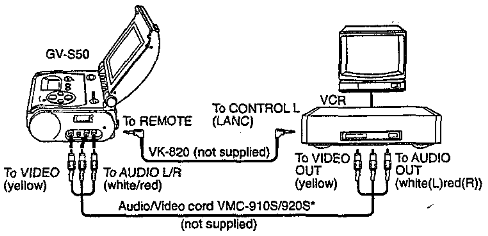
* Although this unit does not have an EDIT function, using this function on a VCR connected to this unit for editing will avoid deterioration of the picture on the duplicated tape.

Notes on connection
Note that cord plugs and jacks are color coded. Red plugs and jacks are for the right audio channel, white ones are for the left audio channel and yellow ones are for video signals.

Editing from the VCR Equipped with the CONTROL L (LANC ⏣) Terminal

Connect the REMOTE terminal on this unit and the CONTROL L terminal on the other unit, and then set the other unit's LANC mode to "M."
Playback/pause on the other unit and recording/pause on this unit can be operated simultaneously from the other unit by pressing only one button.

Connection


GV-S50
To REMOTE
To CONTROL L (LANC)
VCR
VK-820 (not supplied)
To VIDEO (yellow)
To AUDIO L/R (white/red)
To VIDEO OUT (yellow)
To AUDIO OUT (white(L)red(R))
Audio/Video cord VMC-910S/920S*
(not supplied)

* If the other VCR is monaural type, use the VMC-910MS or VMC-920MS (not supplied).

Operation

1 **Turn on the power of both units.**

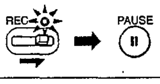
2 **Insert a source tape into the other VCR (playback) and a tape for recording into this unit (recording).**

3 **Select the tape speed ("SP" or "LP" from "REC MODE") on the menu screen of this unit.**
See "Settings on the Menu Screen" on pages 25 and 26.

4 **Activate the EDIT function if it is provided with the other VCR.**

5 **Locate the playback start point and press the pause button on the other VCR.**

6 **Slide REC in the direction of the arrow and press PAUSE ⏸ on this unit.**
This unit is now in recording pause mode.



7 **Press SYNCHRO EDIT on the other equipment to release the pause.**

8 **Press SYNCHRO EDIT on the other equipment to pause both units again.**

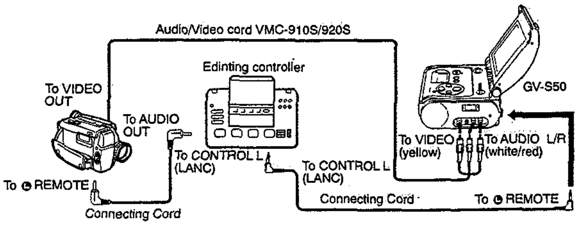
9 **Repeat steps 7 and 8 to edit other scenes.**

10 ***After editing is completed, press the stop buttons (□ on this unit) on both units to stop playback and recording.***

About ⏣(LANC)
LANC stands for Local Application Control Bus System. The LANC terminal is used for controlling the tape transport of video equipment and peripherals connected to it. This terminal has the same function as those indicated as CONTROL L or REMOTE.

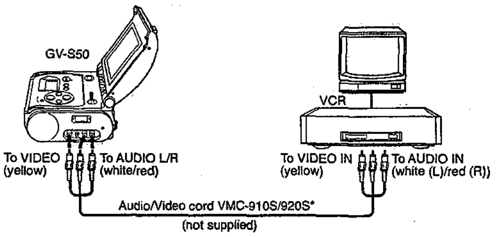
Editing with an Editing Controller

By adding an editing controller to the video equipment connected through the LANC terminals, the various piece of equipment can be operated with the controller.


Audio/Video cord VMC-910S/920S
Edinting controller
To VIDEO OUT
To AUDIO OUT
GV-S50
To CONTROL L (LANC)
To CONTROL L (LANC)
To VIDEO (yellow)
To AUDIO L/R (white/red)
To ⊕ REMOTE
Connecting Cord
Connecting Cord
To ⊕ REMOTE

Editing from This Unit to Another VCR

Connection


GV-S50
VCR
To VIDEO (yellow)
To AUDIO L/R (white/red)
To VIDEO IN (yellow)
To AUDIO IN (white (L)/red (R))
Audio/Video cord VMC-910S/920S*
(not supplied)

* If the other VCR is monaural type, use the VMC-910MS or VMC-920MS (not supplied).

Operation

1 ***Turn on the power of both units.***

2 **Insert a source tape into this unit (playback) and a tape for recording into the other VCR (recording).**

3 **Select the tape speed (SP/LP) on the other VCR.**

4 **Activate the EDIT function if it is provided with the other VCR.**

5 **Locate the playback start point and press PAUSE ⏸ on this unit.**

6 **Put the other VCR into recording pause mode**

7 **Press the pause buttons (PAUSE ⏸ on this unit) on both units to release the pause.**

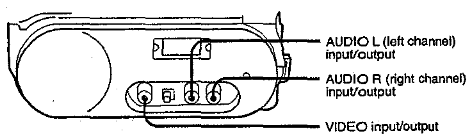
8 **Press the pause buttons on both units to pause the units again.**

9 **Repeat steps 7 and 8 to edit more scenes.**

10 **After editing is completed, press the stop buttons (□ on this unit) on both units to stop playback and recording.**

VIDEO/AUDIO Input/Output Jacks

The VIDEO/AUDIO input/output jacks automatically become either input or output jacks according to the operating modes of this unit.


AUDIO L (left channel) input/output
AUDIO R (right channel) input/output
VIDEO input/output

Relation between the operating mode and the input/output status

① When the LINE/TUNER selector on the TGV-3 is set to LINE or the TGV-3 is not installed.

Operating Mode	Input/Output Status
Stop	Input
Playback	Output
Recording	Input

② When the LINE/TUNER selector on the TGV-3 is set to TUNER (power is supplied).

Operating Mode	*Input/Output Status*
Stop	Output
Playback	Output
Recording	Output

The current status will appear on the screen for five seconds in the following cases:
- when the status has changed
- when you press DISPLAY

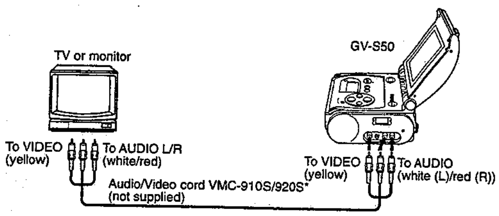
Connecting Other Video Equipment

You can connect other video equipment such as a TV, monitor, video camera recorder, VCR, etc. through the VIDEO/AUDIO input/output jacks.
For additional information, refer to the operating manuals of the equipment you want to connect.

Connecting a TV or Monitor

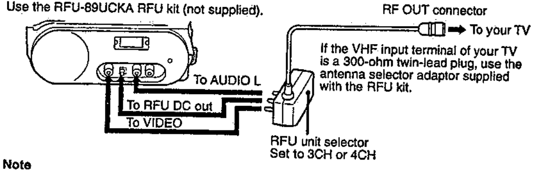
This allows you to view playback pictures on larger screen.

① TV or monitor with audio/video inputs



* If your TV or monitor is monaural type, use the VMC-910MS or VMC-920MS (not supplied).

③ TV without audio/video inputs
Use the RFU-89UCKA RFU kit (not supplied).

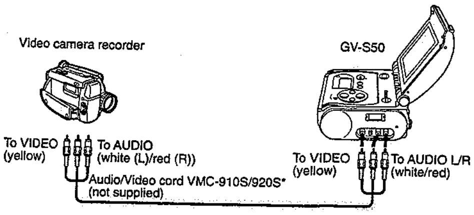

RF OUT connector
To your TV
If the VHF input terminal of your TV is a 300-ohm twin-lead plug, use the antenna selector adaptor supplied with the RFU kit.
To AUDIO L
To RFU DC out
To VIDEO
RFU unit selector
Set to 3CH or 4CH

Note
The RFU 89UCKA includes the following accessories:
- RFU adaptor (1)
- Antenna selector (1)
- Antenna selector adaptor

To set the channel for this unit
To view the playback picture of this unit, set the selector of the RFU adaptor to channel 3 or 4, whichever channel is not active in your area, and select the same channel on the connected TV.

Connecting a Video Camera Recorder

This allows you to monitor the pictures actually being taken.



* If your camera recorder is monaural type, use the VMC-910MS or VMC-920MS (not supplied).

Connecting a VCR

This allows you to dub or edit tapes as explained before. See pages 30 – 35.

Maintenance

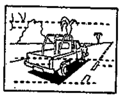
Main Unit

- When the unit is not used for a long period of time, periodically turn on the power and play back a tape for about three minutes.
- Clean the cabinet with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Video Head Cleaning

To ensure a clear picture, clean the video heads periodically.
If playback pictures are noisy or hardly visible, the video heads may be contaminated. If this happens, clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied) referring to the instructions supplied with it.

Caution
Do not use commercially available wet-type cleaning cassettes.
They may damage the video heads.



Note
If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Video Head Replacement
When playback pictures are not clear even after using the cleaning cassette, the video head may be damaged. If this happens, the video head needs to be replaced with a new one. Consult your Sony service facility for replacing the video head.

Built-in Lighting System

A built-in lighting system is installed inside the liquid crystal screen of this unit. Eventually the small fluorescent tube used for this built-in lighting system wears out. If the tube becomes dim or goes off immediately after you turn on the unit, even with new batteries, replace the tube with a new one. To replace the tube, consult the dealer where you purchased the unit, or a Sony service facility. The expected life of the small fluorescent tube is about three years if this unit is used for an hour each day. When you use this unit in a cold environment, the fluorescent tube will be dimmer at first. As soon as the temperature of the tube rises, it will regain its original brightness.

LCD

- Do not push the display forcibly.
- If the unit is used in a cold place, a residual image may appear on the screen. This is not a malfunction of the unit.
- Constant bright points of light (red, blue, or green) may appear on the screen. This is not a malfunction of the unit.

Moisture Condensation

If this unit is brought directly from a cold place to a warm place, moisture may condense inside the unit or on the surface of the tape. If this happens, the tape may stick to the head drum, damaging both the tape and the unit. Although this unit is furnished with a moisture sensor to prevent possible damage from condensation, it cannot prevent damage if a tape is left inside the unit. It is best to remove the tape if you are not using the unit.

If moisture condenses inside the unit
"DEW" appears on the screen.
No button will function except EJECT ⏏.
Eject the cassette, turn off the unit and leave the cassette holder open for at least an hour.
The unit can be used again if "DEW" does not appear when one of the tape transport buttons (▷, □, PAUSE II, FF ▶▶ or REW ◀◀) is pressed.

Using Your Video Recorder/Monitor Abroad

If you prepare fully charged battery packs and the supplied AC power adaptor (which can be used in all areas with a local power supply ranging from 100 V – 240 V), you can use your video recorder/monitor in any country. However, since the shape of the outlet differs widely in the world, you may need an AC plug adaptor.
Each country has special TV color broadcast and electricity systems. This unit is designed to play back and record using the NTSC color video signals. Playback and recording of video sources of other color signals (PAL and SECAM) cannot be guaranteed.

Countries using NTSC color signal
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, the Philippines, U.S.A., etc.

1-2. TGV-3

This section is extracted from TGV-3 instruction manual.

Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

Precautions

Operation

- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Avoid rough handling or mechanical shock to the unit.
- Do not wrap up the unit and operate it because heat may build up internally.
- Avoid using and storing the unit in the following locations:
  - –susceptible to vibration
  - –exposed to strong magnetic fields
  - –near TV or radio transmitters where strong radio waves are generated
  - –on the sand

Care

- Clean the unit body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Preliminary

Overview of the TGV-3

The TGV-3 is a tuner timer unit designed to be used with the GV-S50 8mm video recorder/monitor.

By connecting the GV-S50 8mm video recorder/monitor
- You can watch TV programs. (page 18)
- You can record TV programs. (page 24)

Features

- **Easy-to-use menu screen function**
- **Timer-activated recording**
- **SLEEP TIMER for turning off the unit automatically**

Menu Screen

The TGV-3 is equipped with a menu screen function. You can perform certain operations on the menu screen.
The TUNER MENU appears on the screen of the GV-S50 8mm video recorder/monitor when you press MENU. Select the desired item on the TUNER MENU screen. For more details, see reference pages in the table below.

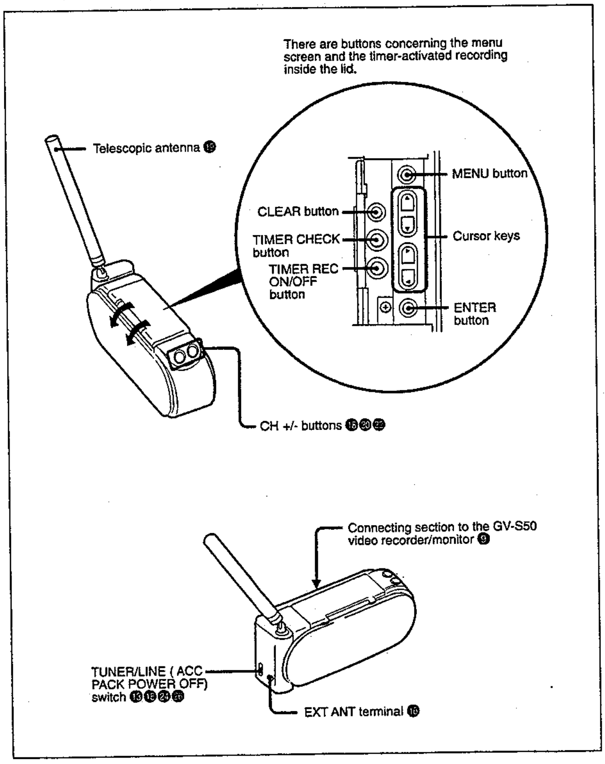
Menu screen

Menu item	Setting purpose	Reference page
TIMER SET	To preset timer-activated recordings	26 – 28
SLEEP TIMER	To turn off the unit automatically after a certain time	22
CHANNEL	To determine how to get a channel (DIRECT or SEEK)	20 – 21
CLOCK SET	To set the date and the time	11 – 12
TUNER PRESET	To preset TV channels	13 – 15

Note
The TUNER MENU does not appear while recording or playing back a tape on the GV-S50 video recorder/monitor.

Location of Parts and Controls

For details, refer to the pages indicated in circles.


There are buttons concerning the menu screen and the timer-activated recording inside the lid.
Telescopic antenna ⓰
MENU button
CLEAR button
Cursor keys
TIMER CHECK button
TIMER REC ON/OFF button
ENTER button
CH +/- buttons ⓰⓴㉒
Connecting section to the GV-S50 video recorder/monitor ❾
TUNER/LINE (ACC PACK POWER OFF) switch ⓭⓰㉔㉕
EXT ANT terminal ⓰

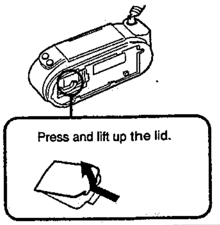
Getting Started

Power Sources

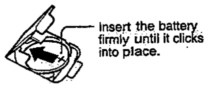
The TGV-3 automatically turns on and off when the GV-S50 video recorder/monitor turns on and off. The power for this unit is supplied from the GV-S50 video recorder/monitor. You do not have to connect any power source to the TGV-3 itself except a lithium battery which powers the clock and keeps the last channel in memory when the GV-S50 video recorder/monitor turns off.

Installing a Lithium Battery

1 **Open the lid of the lithium battery compartment.**

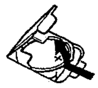

Press and lift up the lid.

2 **Install the supplied CR2032 lithium battery with the + side facing out.**


Insert the battery firmly until it clicks into place.

3 **Close the lid.**

To remove the lithium battery
Push the battery forward and remove it as illustrated.



Power Sources

Lithium battery life
Approximately one year in normal operation.
If the lithium battery becomes weak, the message "CLOCK SET" appears when you select the TIMER SET menu. But even though you select the CLOCK SET menu, the "12:00AM" indication appears and the clock does not operate.
In this case, replace the battery with a Sony CR2032 lithium battery. Use of another battery may present a risk of fire or explosion. After replacing the battery, readjust the clock.

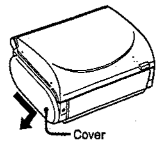
Cautions
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.
- Before use, wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, as that may cause short-circuit.
- Do not break up the battery or throw it into a fire because it may explode. Carefully dispose of the used batteries.

Warning
Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

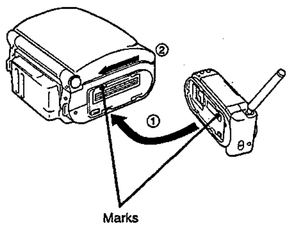
Connecting the GV-S50 Video Recorder/Monitor

Attaching the GV-S50 Video Recorder/Monitor

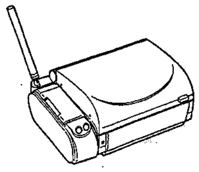
1 Remove the cover while sliding the RELEASE lever in the direction of the arrow (—).



2 Align the marks of the connecting sections of this unit and the GV-S50 as illustrated (①), then slide this unit backward until it clicks (②).

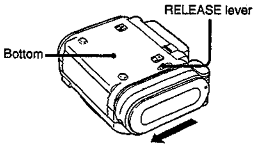


3



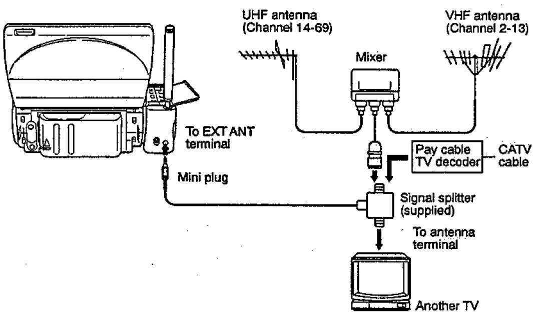
Note
When this unit is not connected to the GV-S50, be sure to attach the cover to the connecting section of the GV-S50 to prevent damage.

To remove the GV-S50 video recorder/monitor
Pull this unit forward while sliding the RELEASE lever in the direction of the arrow (—).



Connecting an Outdoor Antenna and CATV cable

If you cannot obtain satisfactory reception with the telescopic antenna, or when recording TV programs, use an outdoor antenna. For viewing CATV channels, connect the CATV cable.

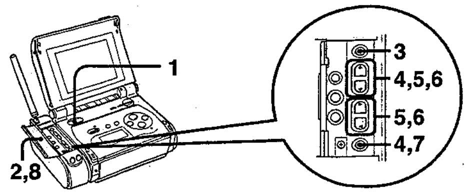


Note
- Before connecting the antennas, turn off the unit.
- Make connections firmly. A loose connection may cause a distorted picture.
- When using the unit in a car, use the optional VCA-3W or VCA-4E car antenna, etc. For details, refer to the operating instructions of the car antenna.

Setting the Clock

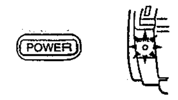
Before setting
Check the following points:
- Is the lithium battery installed correctly? (page 7)
- Is this unit connected to the GV-S50 video recorder/monitor? (page 9)
- Is the TUNER/LINE switch set to TUNER?

The built-in clock of this unit uses the 12-hour system.
0:00AM stands for midnight and 0:00PM for noon.

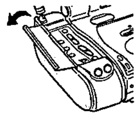


Example: Set to 1:15PM, July 4, 1992

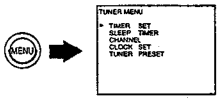
1 Press POWER of the GV-S50 video recorder/monitor.
This unit turns on simultaneously.
The POWER lamp on the front panel of the GV-S50 lights up.



2 Open the lid.



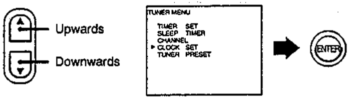
3 Press MENU.
The TUNER MENU display appears on the screen of the GV-S50.



TUNER MENU
▸ TIMER SET
SLEEP TIMER
CHANNEL
CLOCK SET
TUNER PRESET

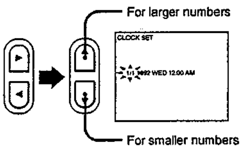
Setting the Clock

4 Press ▲ or ▼ of the cursor keys to move the cursor (▶) down to CLOCK SET, and press ENTER.

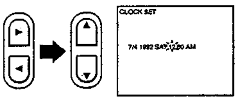

Upwards
Downwards
TUNER MENU
TIMER SET
SLEEP TIMER
CHANNEL
▶ CLOCK SET
TUNER PRESET
ENTER

5 Set the month, day, and year in this order.*
Press ◀ or ▶ to make the item to be set flash, and press ▲ or ▼ until the desired number appears.

- The day of the week is automatically displayed.
- This unit incorporates the calendar until the year 2007.


For larger numbers
CLOCK SET
1/1 1992 WED 12:00 AM
For smaller numbers

6 Set the hour and minute.
Press ◀ or ▶ to make the item to be set flash, and press ▲ or ▼ until the desired number appears.
- Be sure to set AM and PM correctly.


CLOCK SET
7/4 1992 SAT 12:00 AM

7 Press ENTER.
The clock starts and the normal screen resumes.

8 Close the lid.

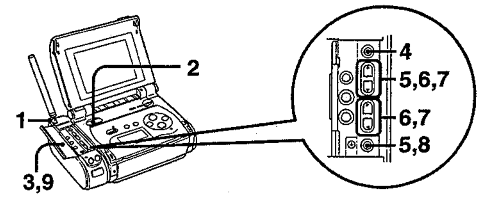
To reset the clock
Repeat steps 3 to 7.

Note
If the lithium battery is not installed, the clock will be reset each time you disconnect the GV-S50 from this unit.

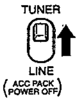
Presetting TV Channels

Presetting Channels

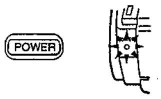
Receivable channels of this unit are:
VHF: 2–13
UHF: 14–69
CATV: 1 (A-8), 98 (A-2), 99 (A-1), 14–36 (A to W), 66–125 (W+30 to W+84).
This unit is preset at the factory to receive certain channels (see chart on page 15). If you want to receive other channels, you need to preset them. Up to 99 channels can be allocated to any desired program position.


2
1
3,9
4
5,6,7
6,7
5,8

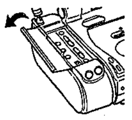
1 Set the TUNER/LINE switch on the rear of this unit to TUNER.


TUNER
LINE
(ACC PACK POWER OFF)

2 Press POWER of the GV-S50 video recorder/monitor.
This unit turns on simultaneously.
The POWER lamp on the front panel of the GV-S50 lights up.

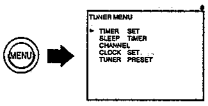


3 Open the lid.

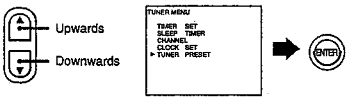


Presetting TV Channels

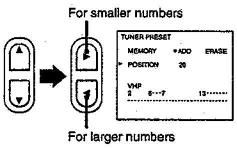
4 Press MENU.
The TUNER MENU display appears on the screen of the GV-S50.


MENU
TUNER MENU
▶ TIMER SET
SLEEP TIMER
CHANNEL
CLOCK SET
TUNER PRESET

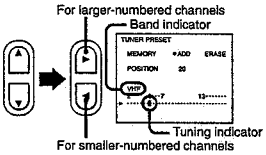
5 Press ▲ or ▼ of the cursor keys to move the cursor (▶) down to TUNER PRESET, and press ENTER.


Upwards
Downwards
TUNER MENU
TIMER SET
SLEEP TIMER
CHANNEL
CLOCK SET
▶ TUNER PRESET
ENTER

6 Press ▲ or ▼ of the cursor keys to move the cursor (▶) down to POSITION, and press ◀ or ▶ to select the desired program position where the channel is to be stored.


For smaller numbers
TUNER PRESET
MEMORY ●ADD ERASE
▶ POSITION 20
VHF
2 6---7 13
For larger numbers

7 Press ▲ or ▼ of the cursor keys to move the cursor (▶) down to the channel range display, and press ◀ or ▶ repeatedly until you get the desired channel.
The UHF channel range is displayed after the VHF range.*
Repeat steps 6 and 7 for other channels to be preset.


For larger-numbered channels
Band indicator
TUNER PRESET
MEMORY ●ADD ERASE
POSITION 20
VHF
2 6---7 13
Tuning indicator
For smaller-numbered channels

* After the channel range is displayed, wait for about two seconds before next operation.

8 Press ENTER.
Channel presetting is completed. The on-screen display disappears.

9 Close the lid.

To change the order of the channels to be stored
Follow the above steps.

Preset channels

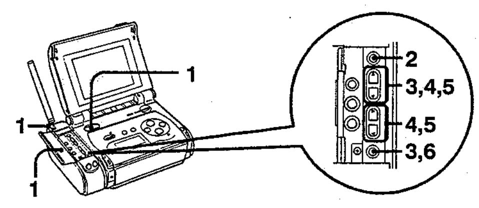
Program position	1	2–13	14–36	37	38–60	61	62–97	98	99
Corresponding channel	CATV 1	VHF 2–13	CATV 14–36	*	—	*	—	CATV 98	CATV 99
Number displayed	1	2–13	14–36	37	—	61	—	98	99

* UHF channels are preset around this number.
— Channels are not preset.

Presetting TV Channels

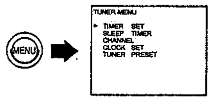
Erasing Program Positions

The erased program position is skipped when you press CH +/–.

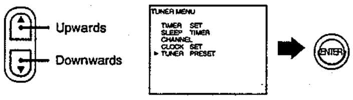

1
1
1
2
3,4,5
4,5
3,6

1 **Proceed steps 1 to 3 of "Presetting Channels" on page 13.**

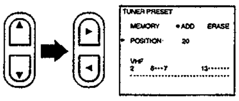
2 **Press MENU.**
The TUNER MENU display appears on the screen of the GV-S50.


MENU
TUNER MENU
▸ TIMER SET
SLEEP TIMER
CHANNEL
CLOCK SET
TUNER PRESET

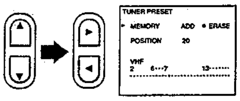
3 **Press ▲ or ▼ of the cursor keys to move the cursor (▸) down to TUNER PRESET, and press ENTER.**


Upwards
Downwards
TUNER MENU
TIMER SET
SLEEP TIMER
CHANNEL
CLOCK SET
▸ TUNER PRESET
ENTER

4 **Press ▲ or ▼ of the cursor keys to move the cursor (▸) down to POSITION, and press ◀ or ▶ to select the program position to be skipped.**


TUNER PRESET
MEMORY •ADD ERASE
▸ POSITION 20
VHF
2 6···7 13·······

5 **Press ▲ or ▼ of the cursor keys to move the cursor (▸) down to MEMORY, and press ◀ or ▶ to select ERASE.**
Repeat steps 4 and 5 for other program positions to be skipped.


TUNER PRESET
▸ MEMORY ADD • ERASE
POSITION 20
VHF
2 6···7 13·······

6 **Press ENTER.**
The on-screen display disappears.

To add the erased channels again
See "Presetting Channels" on page 13.

Channel Allocation Chart

Frequency (MHz)	50	100	150	200	250	300	400	500	600	700	800
VHF/UHF channels	VHF 2-6		VHF 7-13				UHF 14-69				
CATV channels	A-8 A-6	A-2~1		J~W			W + 30~W + 84				
Band indicator	VHF						UHF				

When you press CH +, the above channel will be scanned from the lowest frequency to the highest in sequence. By pressing CH –, the channels will be scanned in reverse.

Cable TV Channel Chart*

Cable TV systems use letters or numbers to designate channels. To tune in a channel, refer to this chart. Check with your local cable TV company for more complete information on the available channels.

Number on this unit	1	98	99	14	15	16	17	18	19	20	21	22
Corrsponding CATV channel	A-8	A-2	A-1	A	B	C	D	E	F	G	H	I

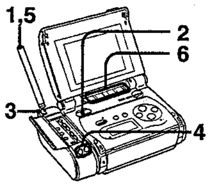
23	24	25	26	27	28	29	30	31	32	33	34	35	36	....
J	K	L	M	N	O	P	Q	R	S	T	U	V	W	W+30.........W+84

* The designation of the cable TV channels conforms to the EIA/NCTA recommendation.

Note
Pay cable TV systems use scrambled or encoded signals and require special converters (decoders) besides the normal cable connections.

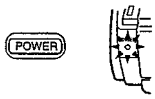
Watching TV Programs

Viewing a Preset TV Program

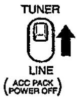


1 **Pull out the telescopic antenna fully.**
Be sure to pull out the base of the telescopic antenna.
If you have connected an external antenna or CATV cables, be sure to fold in the telescopic antenna.

2 **Press POWER of the GV-S50 video recorder/monitor.**
This unit turns on simultaneously.
The POWER lamp on the front panel of the GV-S50 lights up.

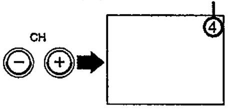


3 **Set the TUNER/LINE switch to TUNER, if a TV program is not displayed.**

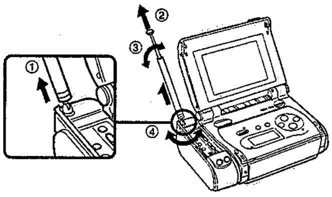

TUNER
LINE
(ACC PACK / POWER OFF)

4 **Select the desired program.**
Press CH + for higher-numbered programs and CH – for lower-numbered programs. The programs appear in numerical sequence. Press CH +/– repeatedly until you get the desired program on the screen.

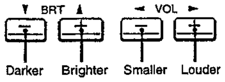
The program position is displayed for a few seconds.



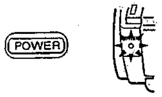
5 **Adjust the telescopic antenna for the best reception.**



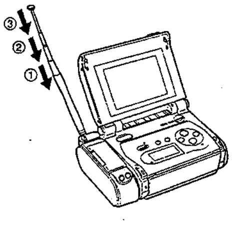
6 **Adjust the volume and brightness.**
Press BRT +/– and VOL +/– on the GV-S50 video recorder/monitor.


▼ BRT ▲
◀ VOL ▶
–
+
–
+
Darker
Brighter
Smaller
Louder

To turn off the TV
Press POWER of the GV-S50 video recorder/monitor.
The POWER lamp on the front panel of the GV-S50 goes out.

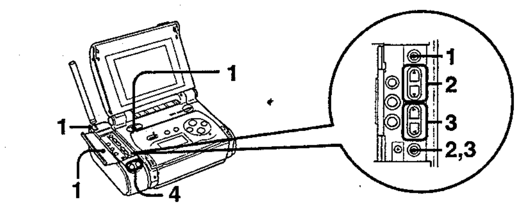


To pull the telescopic antenna away
Slide in the base of the telescopic antenna first, then the center and the point.



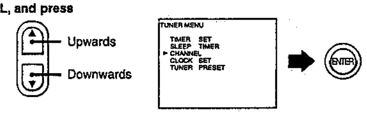
Viewing a TV Program Without Presetting Channels

When you do not know the channel number of the TV program you wish to view or if you want to use this unit in a moving car, search for the program as follows.

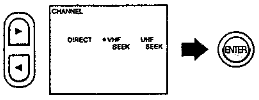


1 **Proceed steps 1 to 4 of "Presetting Channels" on page 13.**

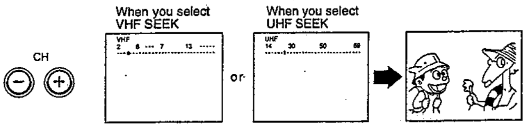
2 **Press ▲ or ▼ of the cursor keys to move the cursor (▶) down to CHANNEL, and press ENTER.**


Upwards
Downwards
TUNER MENU
TIMER SET
SLEEP TIMER
▶ CHANNEL
CLOCK SET
TUNER PRESET
ENTER

3 **Press ◀ or ▶ of the cursor keys to select VHF SEEK or UHF SEEK, and press ENTER.**


CHANNEL
DIRECT
• VHF SEEK
UHF SEEK
ENTER

4 **Press CH +/– buttons to select the channel.**
Press the buttons repeatedly until you get the desired program on the screen.


When you select VHF SEEK
When you select UHF SEEK
CH
VHF
2 6 ··· 7 13 ·····
UHF
14 30 50 69
or

After selecting the channel, the channel range display goes out after a few seconds.

"Last channel" memory function

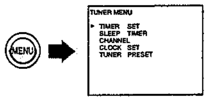
- While you are watching TV programs, if the power source is disconnected or the battery pack becomes exhausted, the unit turns off with the last channel being memorized.
  When you turn on the unit again, the last channel appears on the screen. The lithium battery must be installed for this function.
- The last channel memory function also works when the TV signal is cut off, for example, when you go through a tunnel in a moving car.
- If the lithium battery becomes exhausted but the power source is connected, the last channel memory function will still operate.

Using the SLEEP TIMER

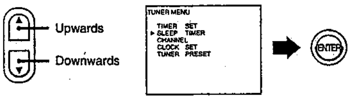
You can set the unit to turn off automatically after a certain amount of time, after as short as 30 minutes or as long as 5 hours, while viewing a TV program, tape playback, or while recording.

Example: To turn off the TV after 2 hours

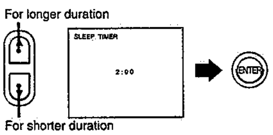
1 **Press MENU.**
The TUNER MENU display appears on the screen of the GV-S50.


MENU
TUNER MENU
▶ TIMER SET
SLEEP TIMER
CHANNEL
CLOCK SET
TUNER PRESET

2 **Press ▲ or ▼ of the cursor keys to move the cursor (▶) down to SLEEP TIMER, and press ENTER.**


Upwards
Downwards
TUNER MENU
TIMER SET
▶ SLEEP TIMER
CHANNEL
CLOCK SET
TUNER PRESET
ENTER

3 **Press ▲ or ▼ of the cursor keys to select the desired time interval, and press ENTER.**
The TV will be turned off automatically after 2 hours.
The procedure is the same for tape playback and recording. The tape will stop running after the selected time interval.
The interval changes up to 5 hours in steps of 30 minutes.


For longer duration
For shorter duration
SLEEP TIMER
2:00
ENTER

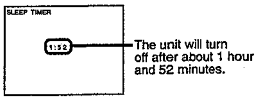
To cancel the SLEEP TIMER

Press POWER of the GV-S50 to turn off the power of the video recorder/monitor.
(Even while playing back or recording a tape, you can cancel the SLEEP TIMER by turning off the power of the video recorder/monitor.)

SLEEP TIMER
-:--

To check the remaining time

Select SLEEP TIMER in the TUNER MENU display, and press ENTER.
The remaining time is displayed.
(You cannot check the remaining time while playing back or recording a tape).

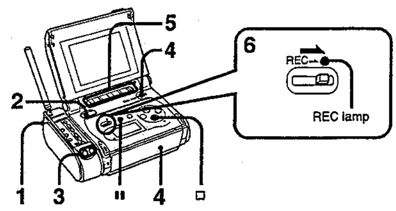

SLEEP TIMER
1:52
The unit will turn off after about 1 hour and 52 minutes.

Note

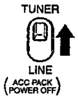
When you use the unit with rechargeable batteries on the GV-S50, the unit may turn off before the selected time because the batteries are exhausted.

Recording TV Programs

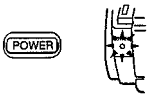
You can record a TV program while viewing it. For better picture and sound quality, connecting an external antenna is recommended.


5
4
6
REC
REC lamp
2
1
3
II
4
□

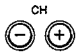
1 **Set the TUNER/LINE switch on the rear of this unit to TUNER.**


TUNER
LINE
(ACC PACK POWER OFF)

2 **Press POWER of the GV-S50 video recorder/monitor.**
This unit turns on simultaneously.
The POWER lamp on the front panel of the GV-S50 lights up.



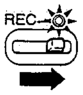
3 **Select the desired TV channel.**



4 **Insert a cassette.**

5 **Select the recording mode, SP or LP.**
Refer to the operating instructions supplied with the GV-S50 video recorder/monitor.
The recording time of a cassette in the LP mode is twice as long as that in the SP mode. For better picture and sound quality, select the SP mode.

6 **Slide REC to the right.**
The REC lamp lights and the recording starts.



To stop recording for a moment	To stop recording
Press **II**. **To resume recording** Press **II** again. (If **II** is not pressed again for about 5 minutes, the pause mode will be released automatically and the GV-S50 will stop. This is to protect the video heads.)	Press □.

When the tape is recorded to the end

The tape stops automatically, but the unit is not turned off. If you are not going to continue operation, turn off the power of the GV-S50.

About the recorded sound

The VOL control setting has no effect on the recording level.

To change the channel during recording

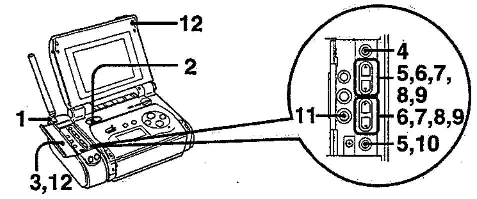
Set the unit in the recording pause mode and then select another channel. You cannot watch another program while recording.

Timer-Activated Recording

By using the timer-activated recording feature, you can preset the GV-S50 to record up to six TV programs within a one-month period.
For better picture and sound quality, connecting an external antenna is recommended.

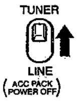
Before setting the timer

- Is the GV-S50 correctly connected to this unit? (See page 9.)
- Make sure that the power is supplied. (Is the battery pack on the GV-S50 fully charged? For long recording, use of the AC power source is recommended.)
- Set the clock correctly. (See page 11.) If the clock is not set, the message "CLOCK SET" appears on the screen.
- Insert a tape correctly. Make sure that the safety tab is slid in. (Refer to the operating instructions of the GV-S50.)
- Note that you cannot set the timer while playing back or recording a tape on the GV-S50.

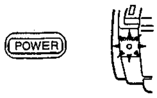

12
2
1
3,12
11
4
5,6,7,
8,9
6,7,8,9
5,10

Example: To record a broadcast on program position 6, from 8:00PM to 8:45PM on Saturday, July 4, 1992, in SP mode

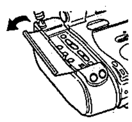
1 **Set the TUNER/LINE switch on the rear of this unit to TUNER.**


TUNER
LINE
(ACC PACK POWER OFF)

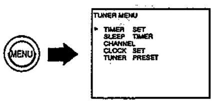
2 **Press POWER of the GV-S50 video recorder/monitor.**
This unit turns on simultaneously.
The POWER lamp on the front panel of the GV-S50 lights up.



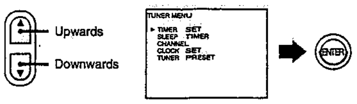
3 **Open the lid.**



4 **Press MENU.**
The TUNER MENU display appears on the screen of the GV-S50.

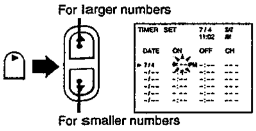

MENU
TUNER MENU
▶ TIMER SET
SLEEP TIMER
CHANNEL
CLOCK SET
TUNER PRESET

5 **Press ▲ or ▼ of the cursor keys to move the cursor (▶) down to TIMER SET, and press ENTER.**

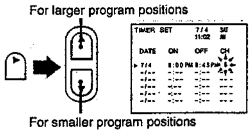

Upwards
Downwards
TUNER MENU
▶ TIMER SET
SLEEP TIMER
CHANNEL
CLOCK SET
TUNER PRESET
ENTER

6 **Set the date, starting time, and ending time.**
Press ▶ of the cursor keys to make the item to be changed flash, and press ▲ or ▼ until the desired date or time appears. (Be sure to set AM and PM correctly.)

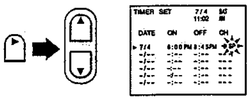
To change an item which is already set
Press ◀ or ▶ of the cursor keys to make the item to be changed flash, and press ▲ or ▼ to change it.


For larger numbers
For smaller numbers
TIMER SET 7/4 SAT 11:02 AM
DATE ON OFF CH
▶ 7/4 8:--PM -:-- ---

7 Select the program to be recorded.
Press ▲ or ▼ until the desired program position appears.


For larger program positions
TIMER SET 7/4 SAT 11:02 AM
DATE ON OFF CH
▶ 7/4 8:00PM 8:45PM 8
For smaller program positions

8 Select the tape speed.
Press ▲ or ▼ to select SP or LP.


TIMER SET 7/4 SAT 11:02 AM
DATE ON OFF CH
▶ 7/4 8:00PM 8:45PM SP

9 Press ▶ to store the setting.
If you want preset another program, press ▼ to move the cursor (▶) to the next line and repeat steps 6 to 9.

10 Press ENTER, or make sure that the cursor (▶) is at the beginning of a line.

11 Press TIMER REC ON/OFF.
The TIMER REC lamp lights up and the GV-S50 turns off.

TIMER REC ON/OFF
TIMER REC

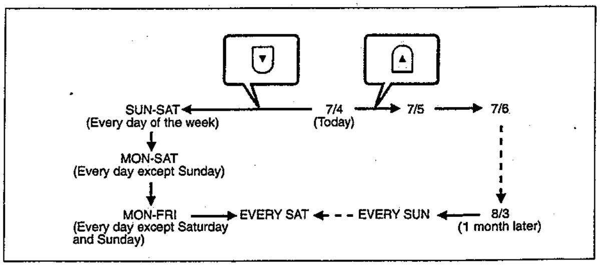
12 Close the lid of this unit and the LCD of the GV-S50.
The recording starts automatically at the preset starting time and the power goes off at the preset ending time.

To stop the timer recording

Press the TIMER REC ON/OFF again.
The TIMER REC lamp goes out and the tape stops.

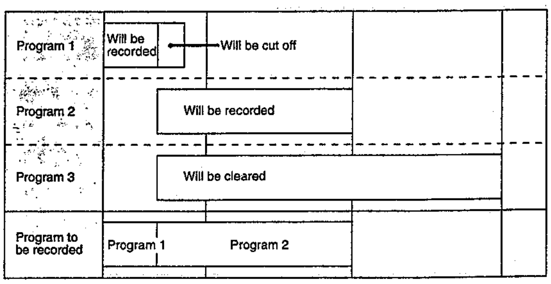
Every Week Recording and Every Day Recording

You can preset to record the same program every day or the same program on a specific day of every week.
When you set the date, press ▲ or ▼, and the indication will change as follows:
For every week recording or every day recording, press ▼ to set the date quickly.


SUN-SAT
(Every day of the week)
7/4
(Today)
7/5
7/6
MON-SAT
(Every day except Sunday)
MON-FRI
(Every day except Saturday and Sunday)
EVERY SAT
EVERY SUN
8/3
(1 month later)

When the presettings of timer recordings overlap

Example


Program 1
Will be recorded
Will be cut off
Program 2
Will be recorded
Program 3
Will be cleared
Program to be recorded
Program 1
Program 2

Program 1: The recording will stop before the program finishes.
Program 2: The program will be recorded completely.
Program 3: The presetting will be canceled.

- **If the starting time of one program comes before the recording of the other program is finished**
  The recording of program 2 begins before program 1 is finished.
- **If the starting time of two programs are the same**
  The program which is preset on the upper line in the TIMER SET display will be recorded and the other program will be cancelled.

Note
If the starting time of the second program is the same as the ending time of the first program, the last 20 seconds of the first program will not be recorded.

While playing back or recording a tape

You cannot set the timer. Set the timer after stopping the tape.

During timer recording standby mode

No buttons other than TIMER REC ON/OFF and TIMER CHECK are operable.

During timer recording

If you want to watch the picture, open the LCD.

To record to the end of the tape

Set the starting and ending time the same. When the tape reaches the end, recording will stop and the power goes off.

If you detach this unit from the video recorder/monitor during timer recording or timer recording standby mode

The timer settings will be canceled even if you attach this unit to the video recorder/monitor again.

If a power interruption occurs or the power is disconnected when using the video recorder/monitor with the AC power source

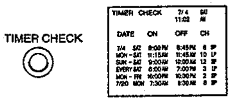
- **During timer recording**
  Timer recording stops. Even if the power is resupplied, recording does not resume.
- **During timer recording standby mode**
  Even if the power is resupplied, the timer function does not work.
  Press TIMER REC ON/OFF again to resume the timer function.

Checking the Contents of Preset Timer Setting

When the unit is in timer recording standby mode or in stop mode

Press TIMER CHECK. The TIMER CHECK display showing the preset timer settings will appear on the screen. If the unit is turned off, turn on the unit, then press TIMER CHECK. The TIMER CHECK display will appear.

To turn off the TIMER CHECK display, press TIMER CHECK again.


TIMER CHECK
TIMER CHECK 7/4 SAT 11:02 AM
DATE ON OFF CH

Note
You cannot check the contents of timer settings while the timer recording is being executed.

Changing the Timer Settings

When the unit is in timer recording standby mode

1 Release the timer recording standby mode by pressing TIMER REC ON/OFF.
2 Turn on the GV-S50.
3 Preset timer again. (See the procedures on pages 26 to 28.)

Note
You cannot change the timer settings while the timer recording is being executed.

Canceling the Timer Settings

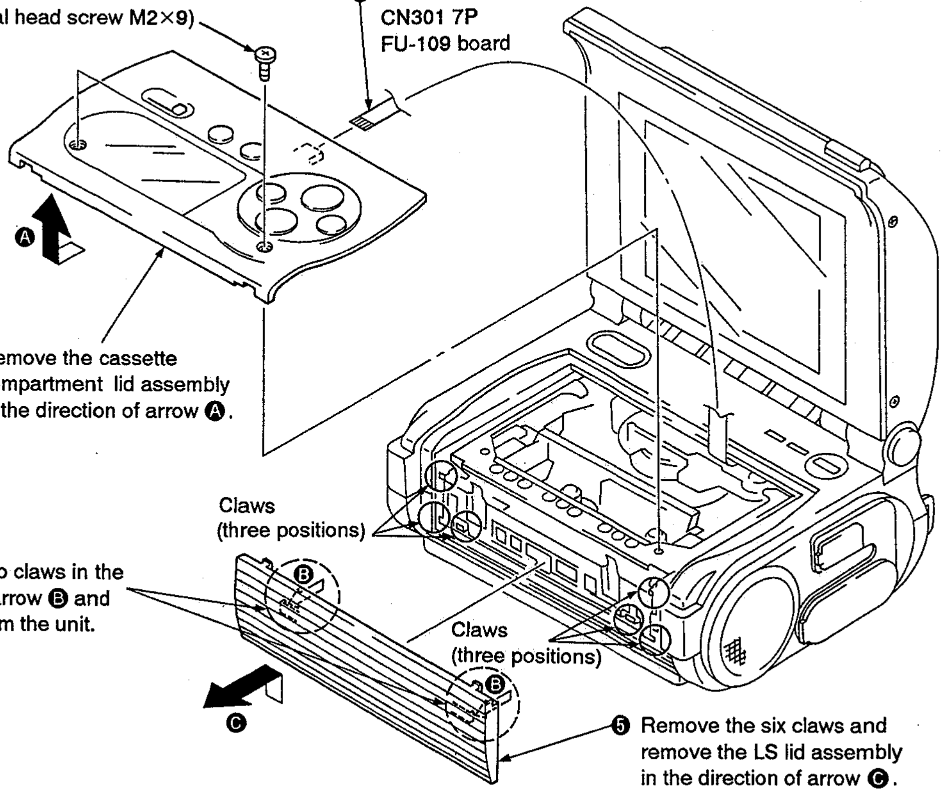
Release the timer recording standby mode by pressing TIMER REC ON/OFF.
Turn on the GV-S50 and select TIMER SET in the TUNER MENU display. In the TIMER SET display, press ▲ or ▼ of the cursor keys to move the cursor (▶) to the setting to be cleared and press CLEAR. The setting will be cleared and "–/– – –:– – –:– – – –" indication resumes.

Operating the Unit After Setting the Timer

1 Press TIMER REC ON/OFF.
  The TIMER REC lamp goes off.
2 Operate the unit.
3 After using it, press TIMER REC ON/OFF to turn on the TIMER REC lamp. The unit turns off and enters timer recording standby mode.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF CASSETTE COMPARTMENT LID ASSEMBLY AND LS LID ASSEMBLY



① Two screws
(special head screw M2×9)

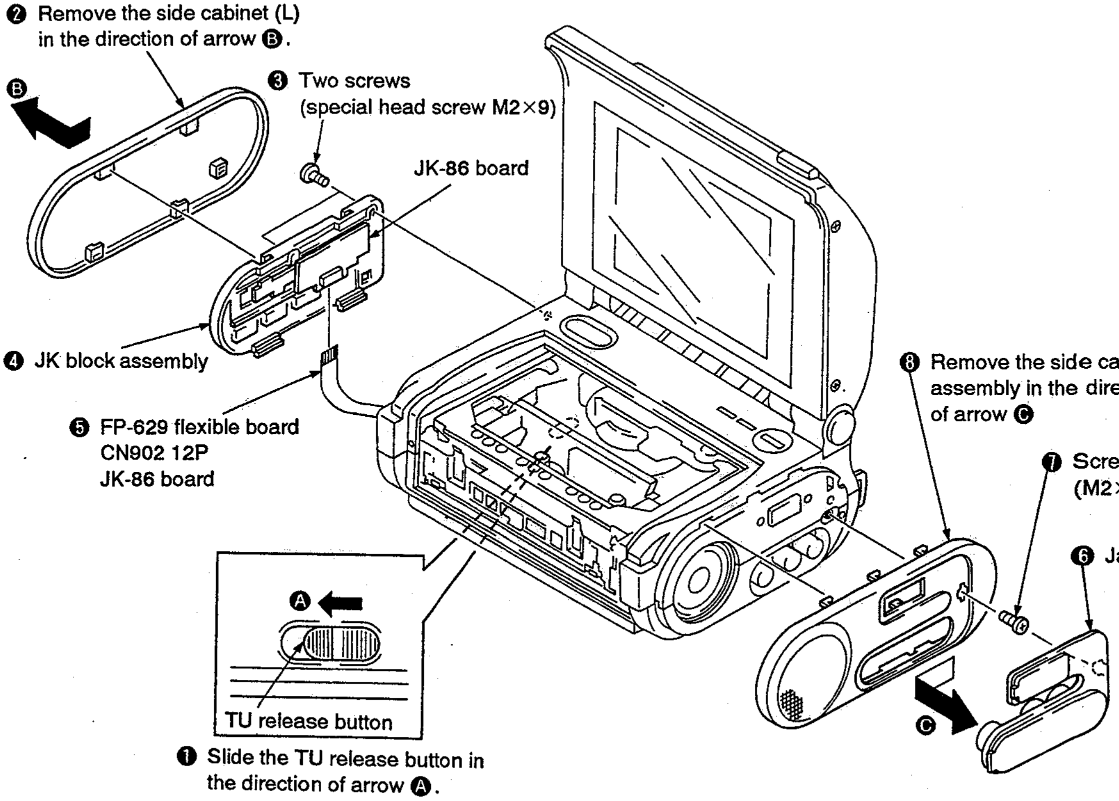
② Remove the cassette
compartment lid assembly
in the direction of arrow Ⓐ.

③ FP-565 flexible board
CN301 7P
FU-109 board

④ Press the two claws in the
direction of arrow Ⓑ and
remove it from the unit.

⑤ Remove the six claws and
remove the LS lid assembly
in the direction of arrow Ⓒ.

2-2. REMOVAL OF SIDE CABINETS (L, R) AND JK BLOCK ASSEMBLIES (JK-86 BOARD)



① Slide the TU release button in
the direction of arrow Ⓐ.

② Remove the side cabinet (L)
in the direction of arrow Ⓑ.

③ Two screws
(special head screw M2×9)

④ JK block assembly

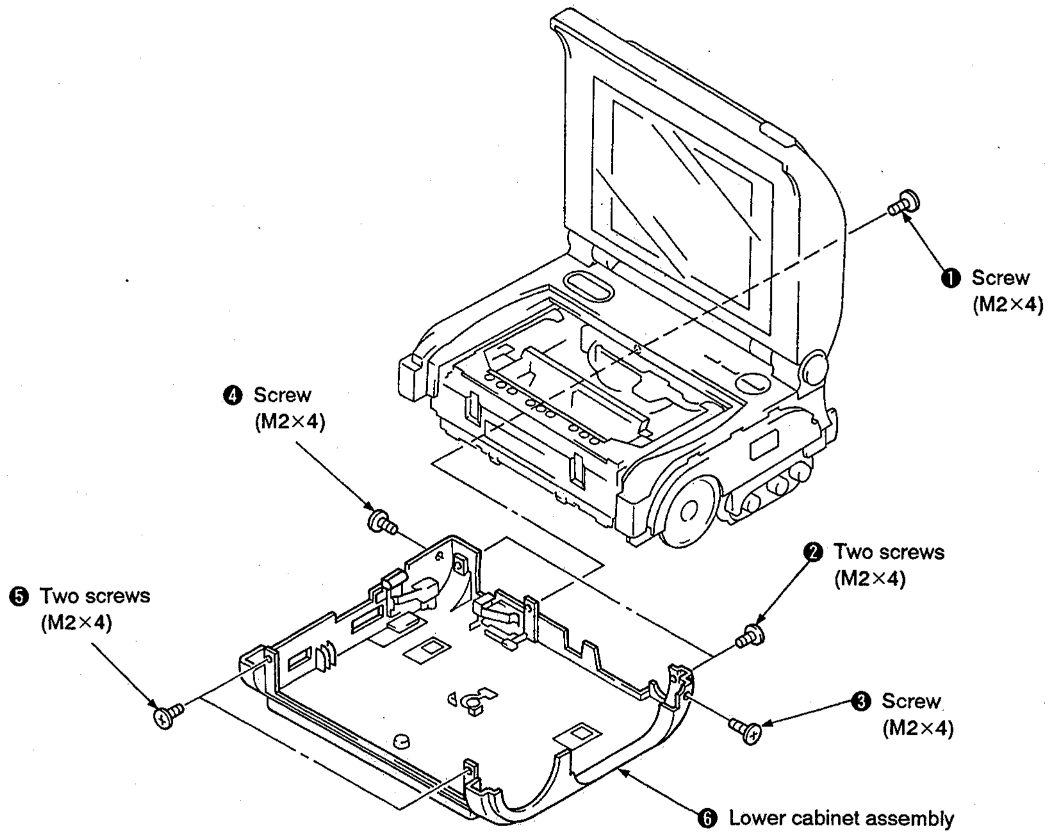
⑤ FP-629 flexible board
CN902 12P
JK-86 board

⑥ Jack cover

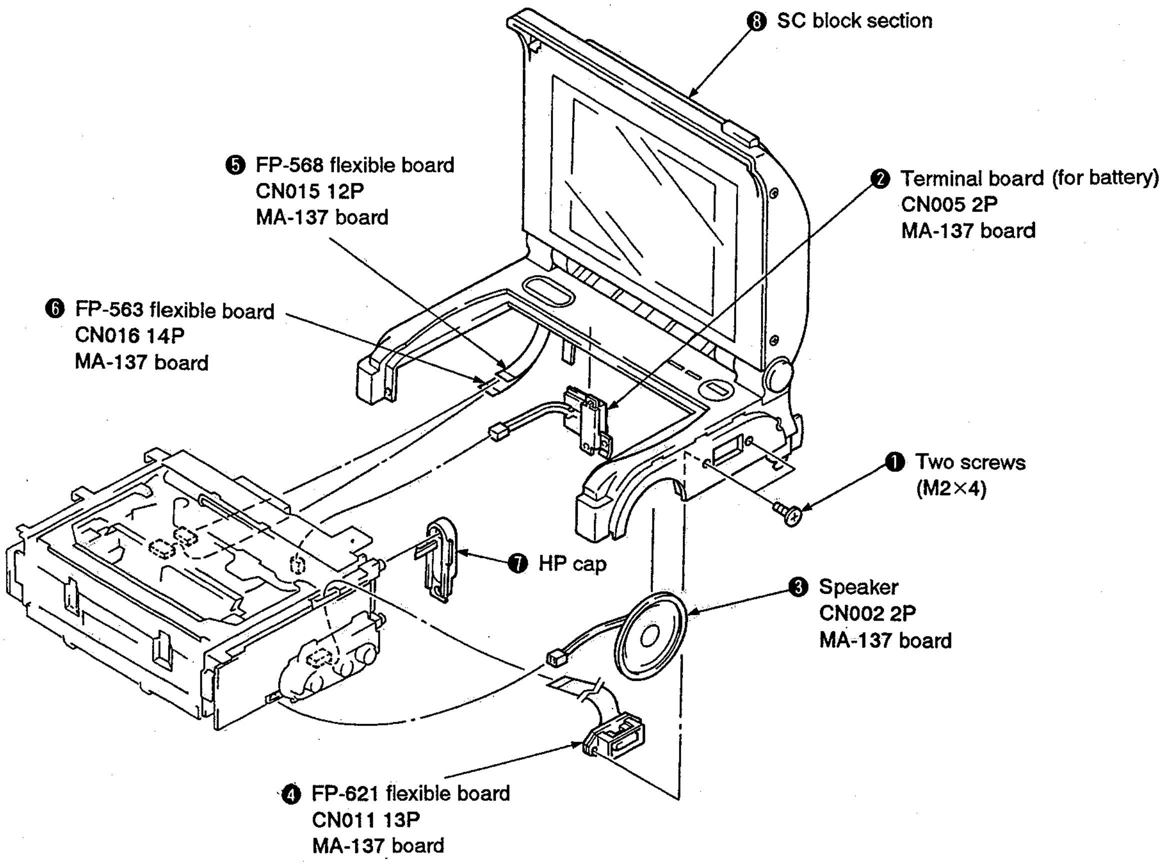
⑦ Screw
(M2×4)

⑧ Remove the side cabinet (R)
assembly in the direction
of arrow Ⓒ

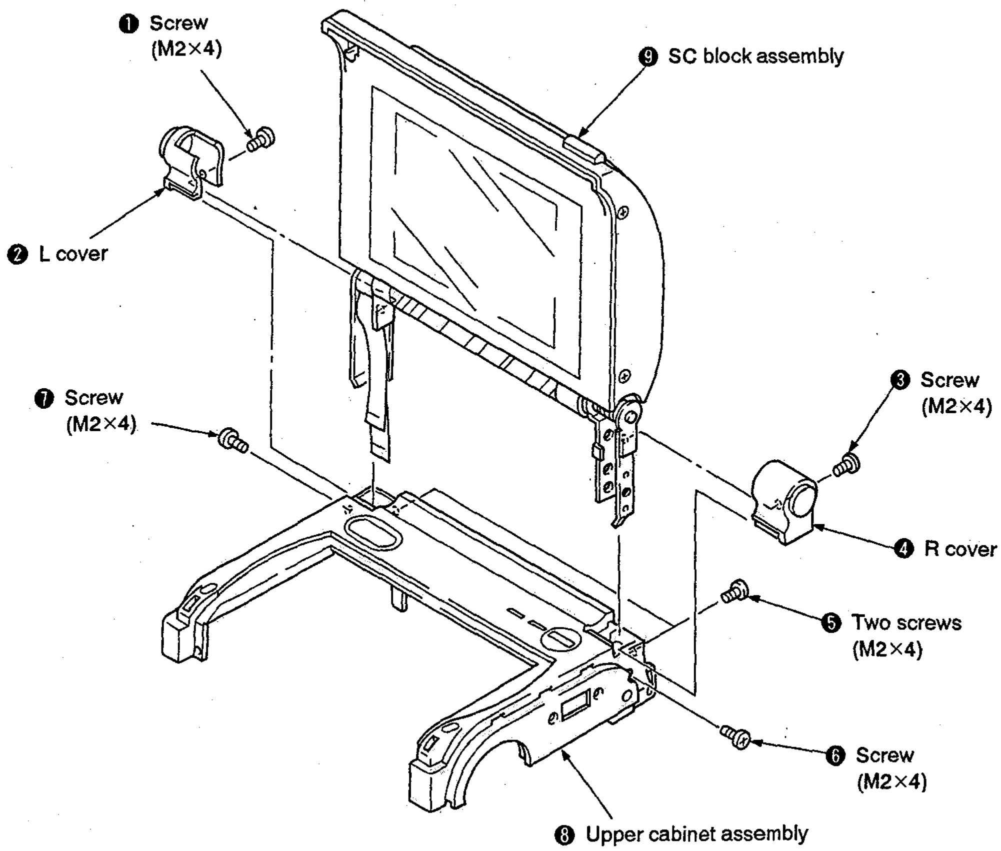
2-3. REMOVAL OF LOWER CABINET ASSEMBLY


❶ Screw
(M2×4)
❹ Screw
(M2×4)
❷ Two screws
(M2×4)
❺ Two screws
(M2×4)
❸ Screw
(M2×4)
❻ Lower cabinet assembly

2-4. REMOVAL OF SC BLOCK SECTION

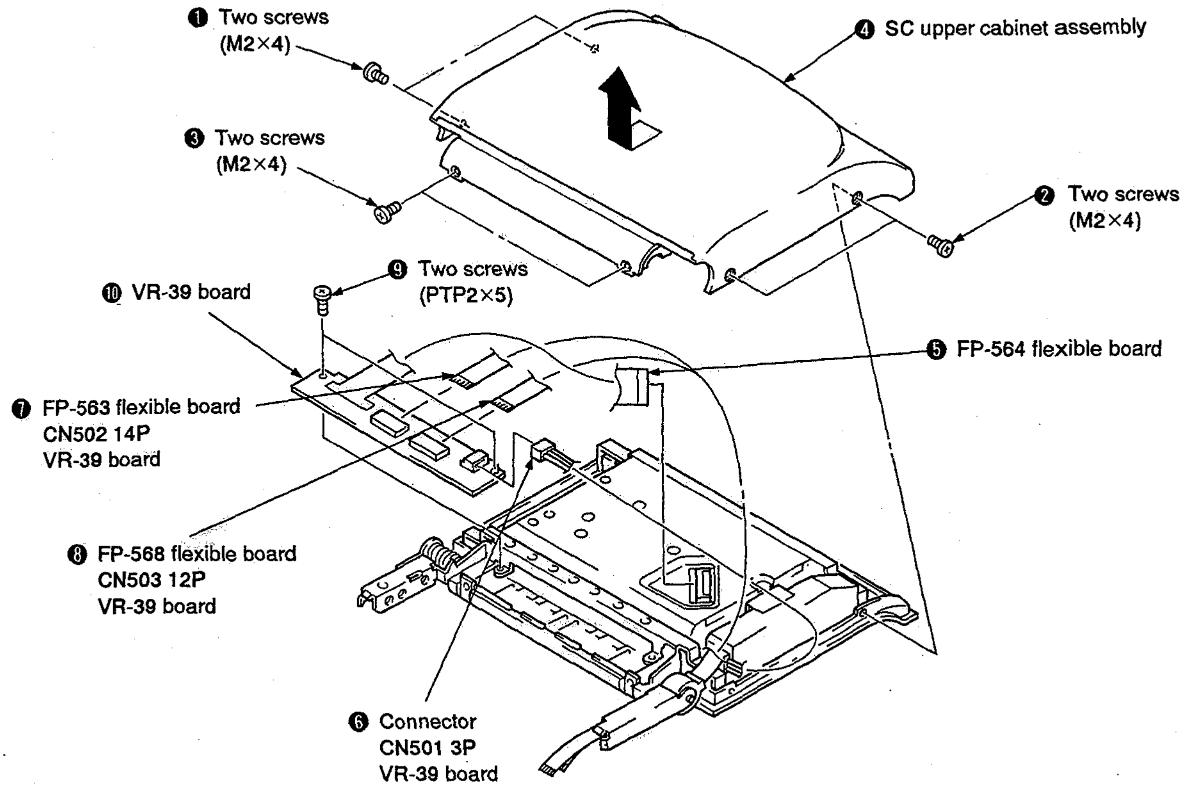

❽ SC block section
❺ FP-568 flexible board
CN015 12P
MA-137 board
❷ Terminal board (for battery)
CN005 2P
MA-137 board
❻ FP-563 flexible board
CN016 14P
MA-137 board
❶ Two screws
(M2×4)
❼ HP cap
❸ Speaker
CN002 2P
MA-137 board
❹ FP-621 flexible board
CN011 13P
MA-137 board

2-5. REMOVAL OF SC BLOCK ASSEMBLY



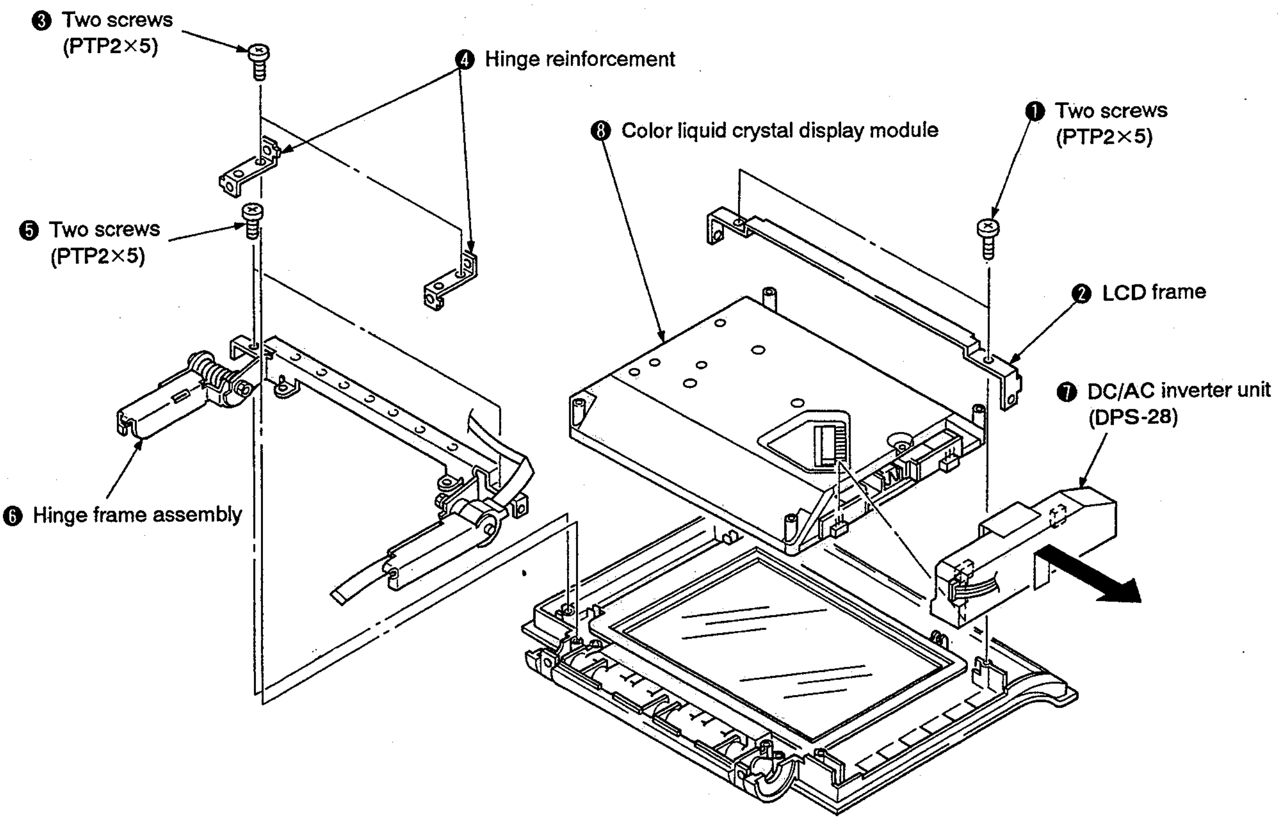
❶ Screw (M2×4)
❾ SC block assembly
❷ L cover
❸ Screw (M2×4)
❼ Screw (M2×4)
❹ R cover
❺ Two screws (M2×4)
❻ Screw (M2×4)
❽ Upper cabinet assembly

2-6. REMOVAL OF VR-39 BOARD

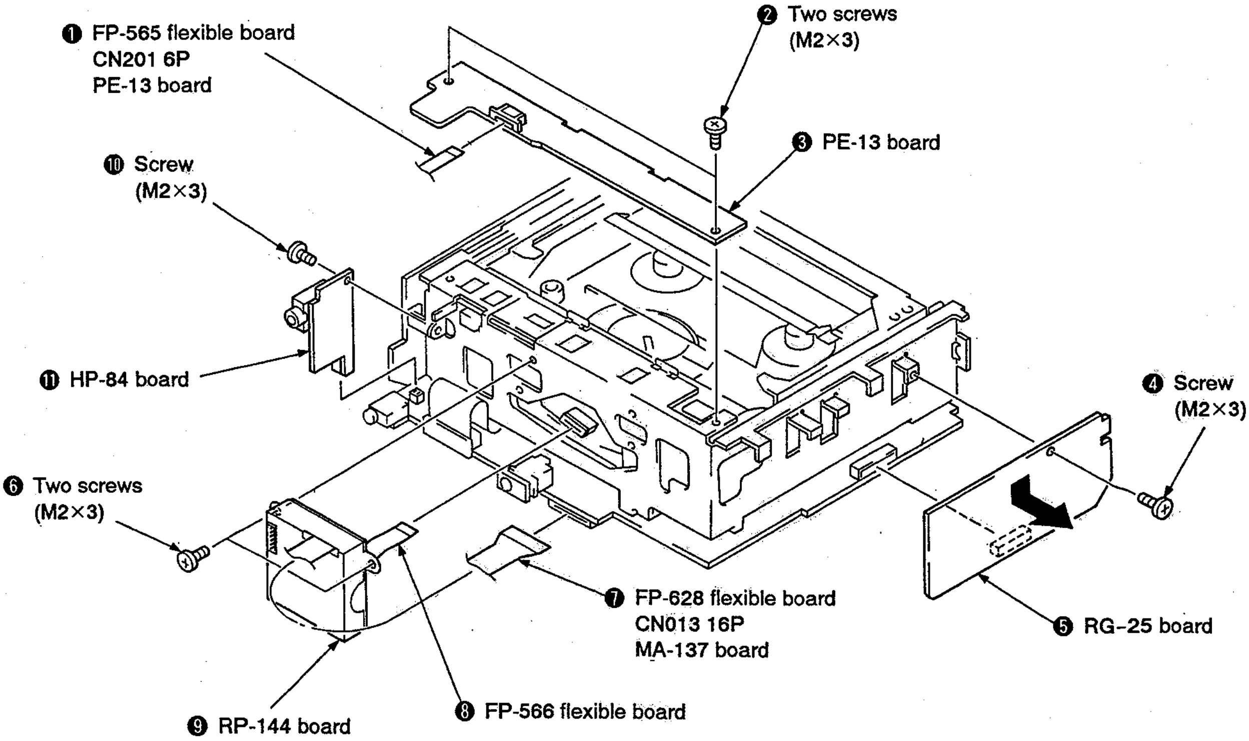


❶ Two screws (M2×4)
❹ SC upper cabinet assembly
❸ Two screws (M2×4)
❷ Two screws (M2×4)
❿ VR-39 board
❾ Two screws (PTP2×5)
❺ FP-564 flexible board
❼ FP-563 flexible board CN502 14P VR-39 board
❽ FP-568 flexible board CN503 12P VR-39 board
❻ Connector CN501 3P VR-39 board

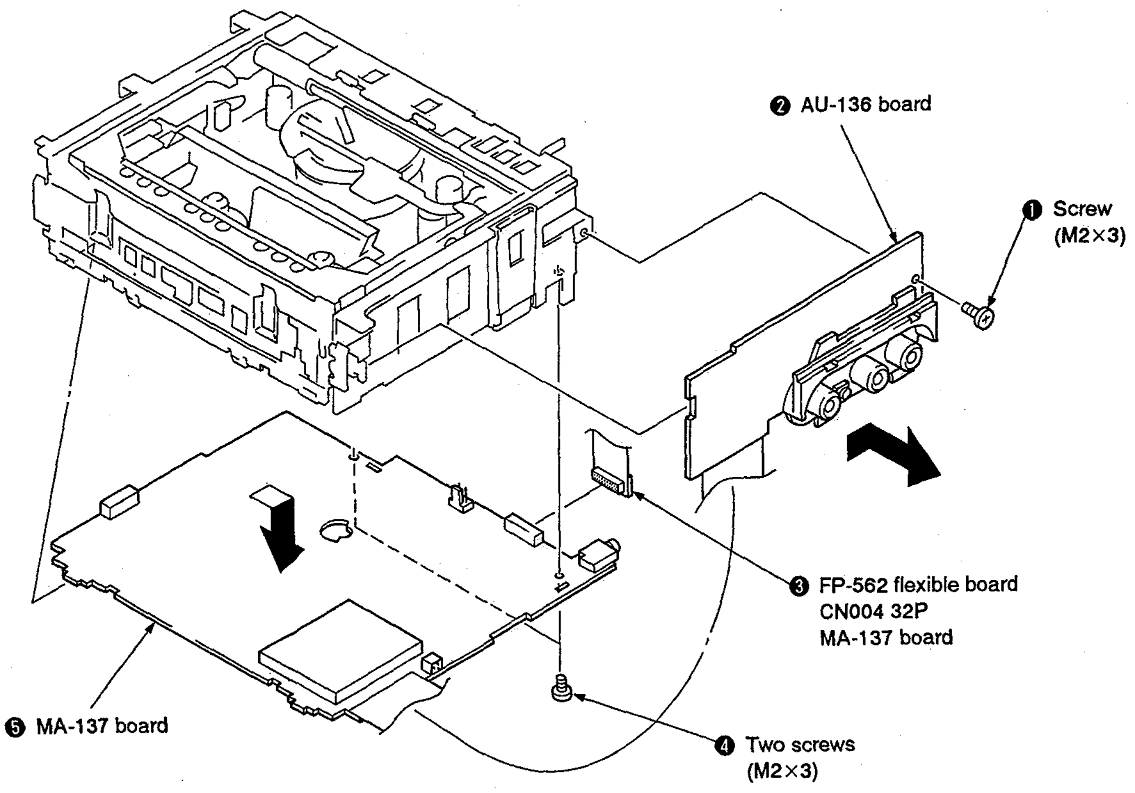
2-7. REMOVAL OF COLOR LIQUID CRYSTAL DISPLAY MODULE


❸ Two screws
(PTP2×5)
❹ Hinge reinforcement
❽ Color liquid crystal display module
❶ Two screws
(PTP2×5)
❺ Two screws
(PTP2×5)
❷ LCD frame
❼ DC/AC inverter unit
(DPS-28)
❻ Hinge frame assembly

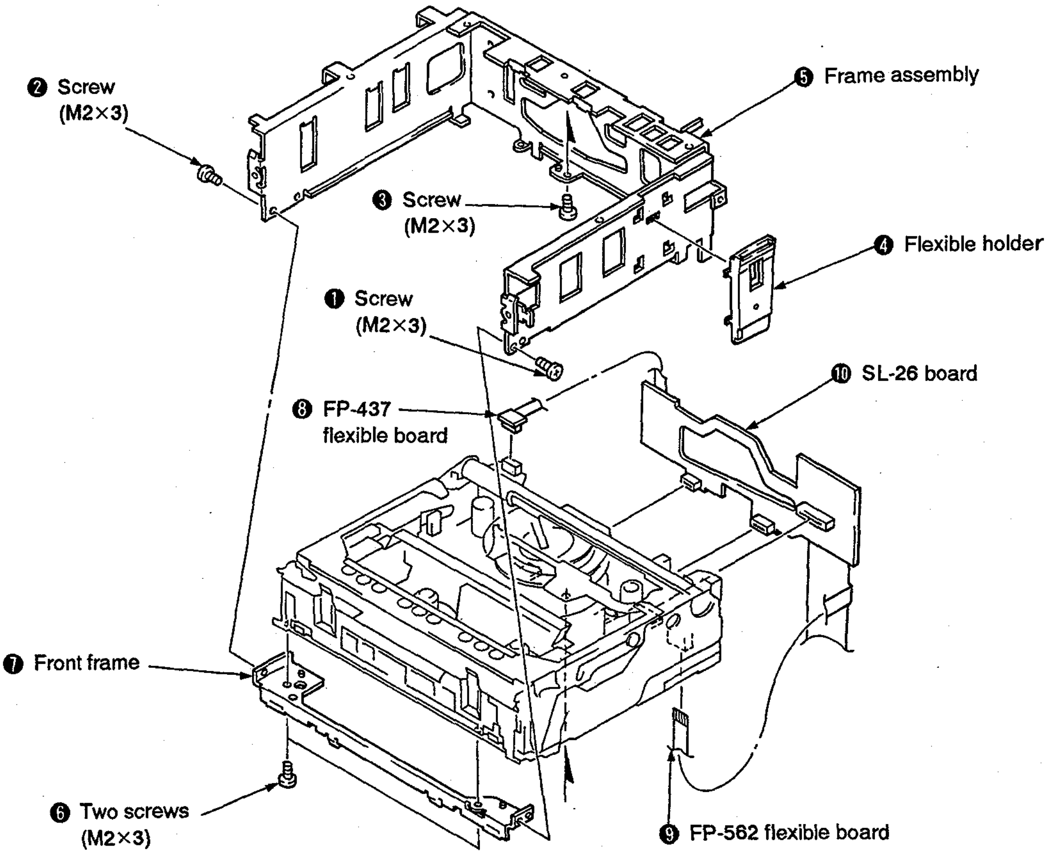
2-8. REMOVAL OF PE-13, RG-25, RP-144, HP-84 BOARDS


❶ FP-565 flexible board
CN201 6P
PE-13 board
❷ Two screws
(M2×3)
❸ PE-13 board
❿ Screw
(M2×3)
⓫ HP-84 board
❹ Screw
(M2×3)
❻ Two screws
(M2×3)
❼ FP-628 flexible board
CN013 16P
MA-137 board
❺ RG-25 board
❾ RP-144 board
❽ FP-566 flexible board

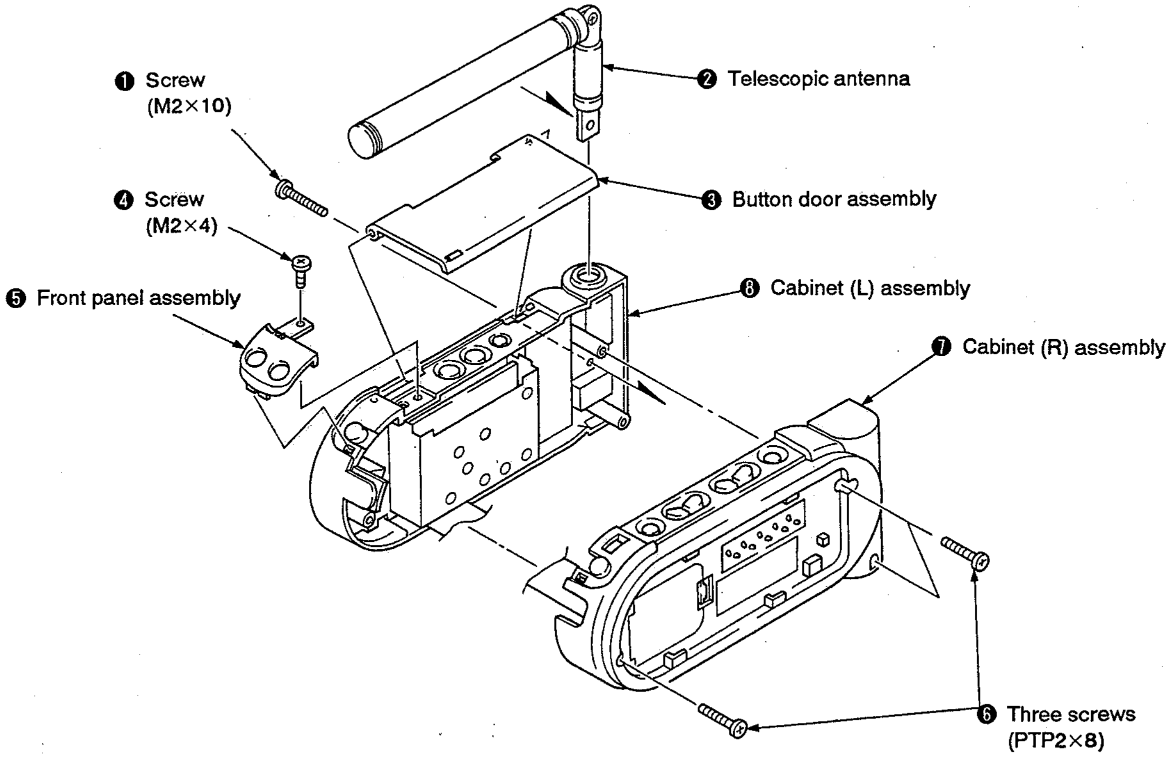
2-9. REMOVAL OF AU-136 AND MA-137 BOARDS


❷ AU-136 board
❶ Screw
(M2×3)
❸ FP-562 flexible board
CN004 32P
MA-137 board
❺ MA-137 board
❹ Two screws
(M2×3)

2-10. REMOVAL OF SL-26 BOARD

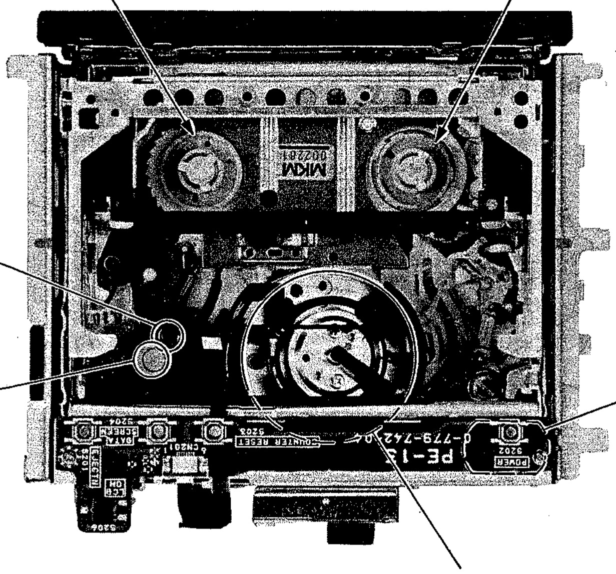

❷ Screw
(M2×3)
❺ Frame assembly
❸ Screw
(M2×3)
❹ Flexible holder
❶ Screw
(M2×3)
❿ SL-26 board
❽ FP-437
flexible board
❼ Front frame
❻ Two screws
(M2×3)
❾ FP-562 flexible board

2-11. REMOVAL OF TELESCOPIC ANTENNA AND CABINET (L, R) ASSEMBLIES


❶ Screw
(M2×10)
❷ Telescopic antenna
❸ Button door assembly
❹ Screw
(M2×4)
❺ Front panel assembly
❽ Cabinet (L) assembly
❼ Cabinet (R) assembly
❻ Three screws
(PTP2×8)

2-12. INTERNAL VIEWS

– Top Side –



T reel table assembly
X-3941-274-1

S reel table assembly
X-3941-275-1

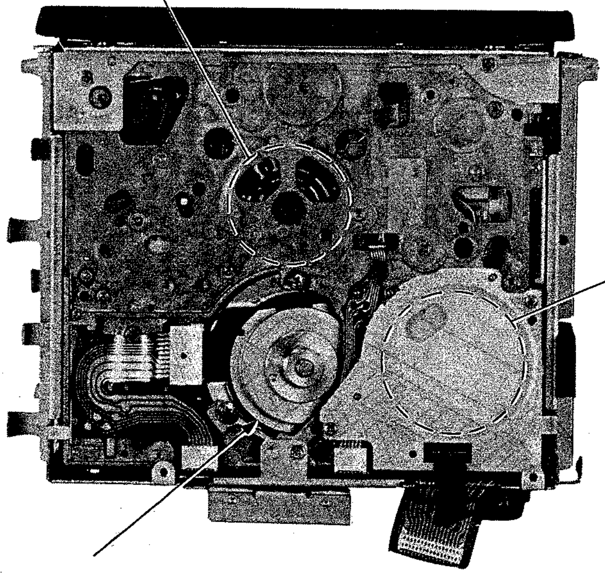
Pinch roller

M902
Capstan motor
(SCE-0102A)
8-835-492-01

M903
Loading motor assembly
A-7040-304-A

M901
Drum assembly (DGH-93A-R)
A-7048-635-A
Upper drum assembly (DGR-93-R)
A-7049-568-A

— Bottom side —



S001
Encoder switch
1-572-986-11

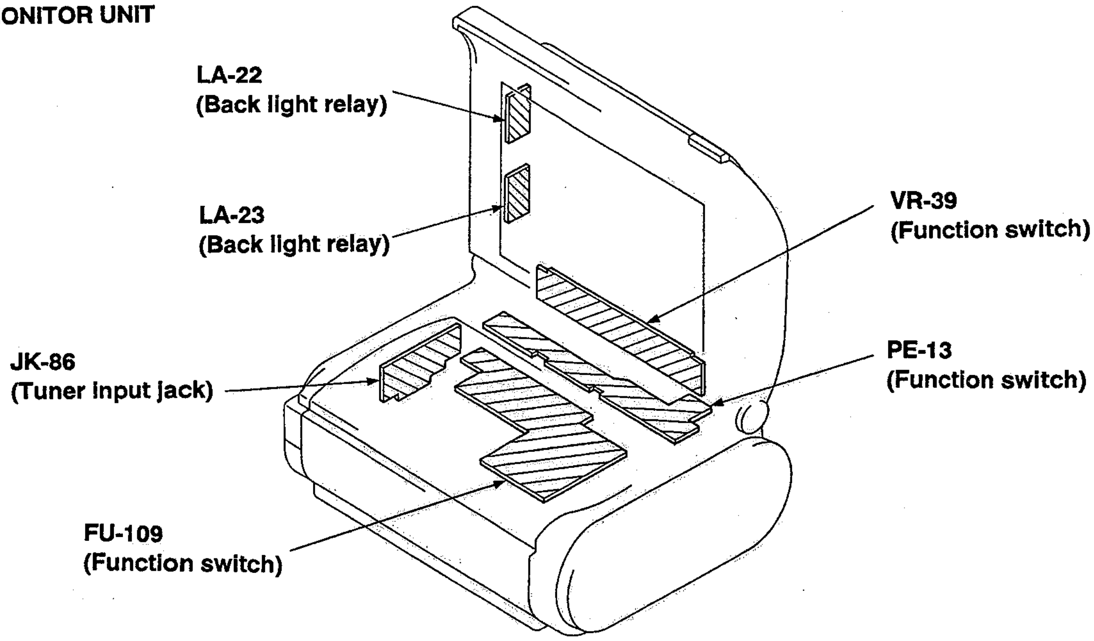
M902
Capstan motor
(SCE-0102A)
8-835-492-01

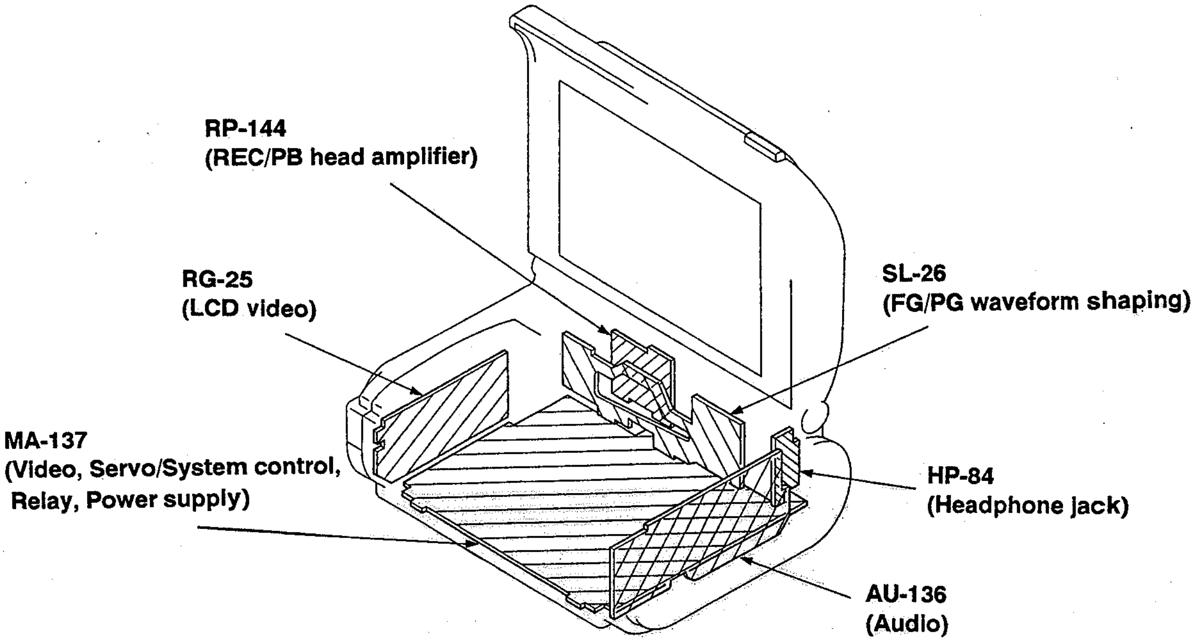
M901
Drum assembly (DGH-93A-R)
A-7048-635-A

SECTION 3
DIAGRAMS

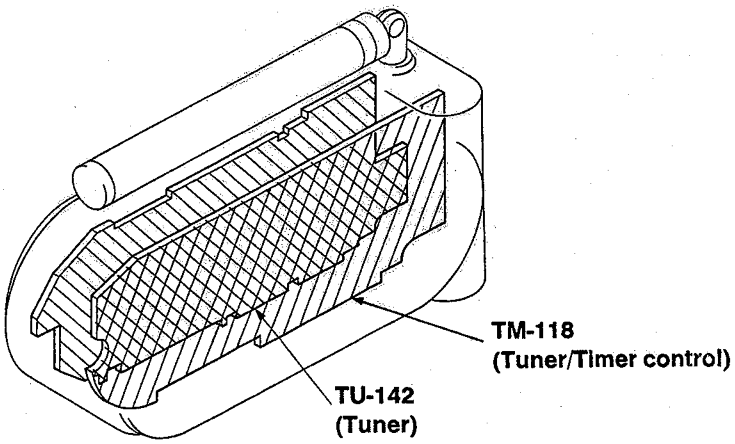
3-1. CIRCUIT BOARDS LOCATION

VTR/MONITOR UNIT

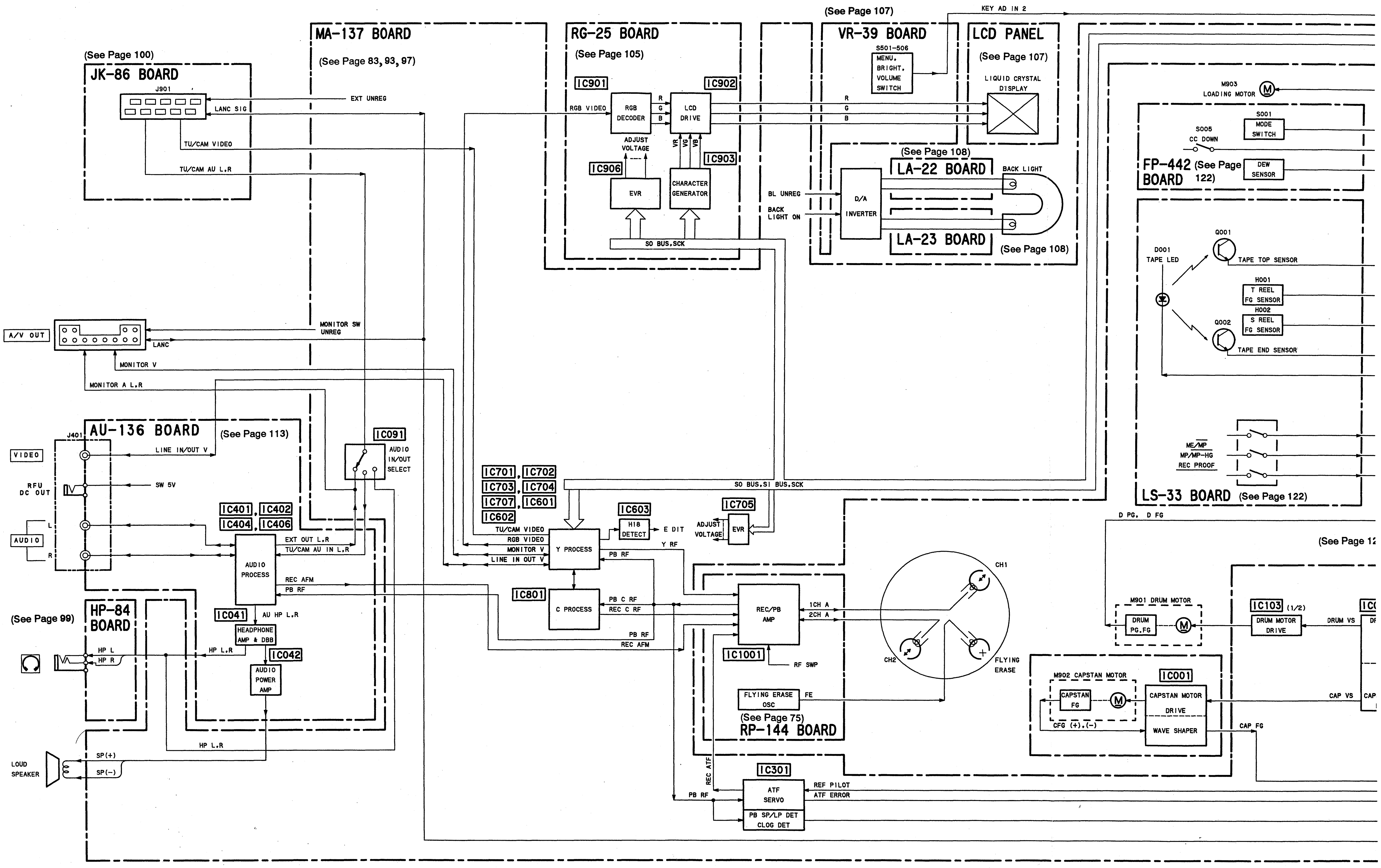

LA-22
(Back light relay)
LA-23
(Back light relay)
VR-39
(Function switch)
JK-86
(Tuner input jack)
PE-13
(Function switch)
FU-109
(Function switch)

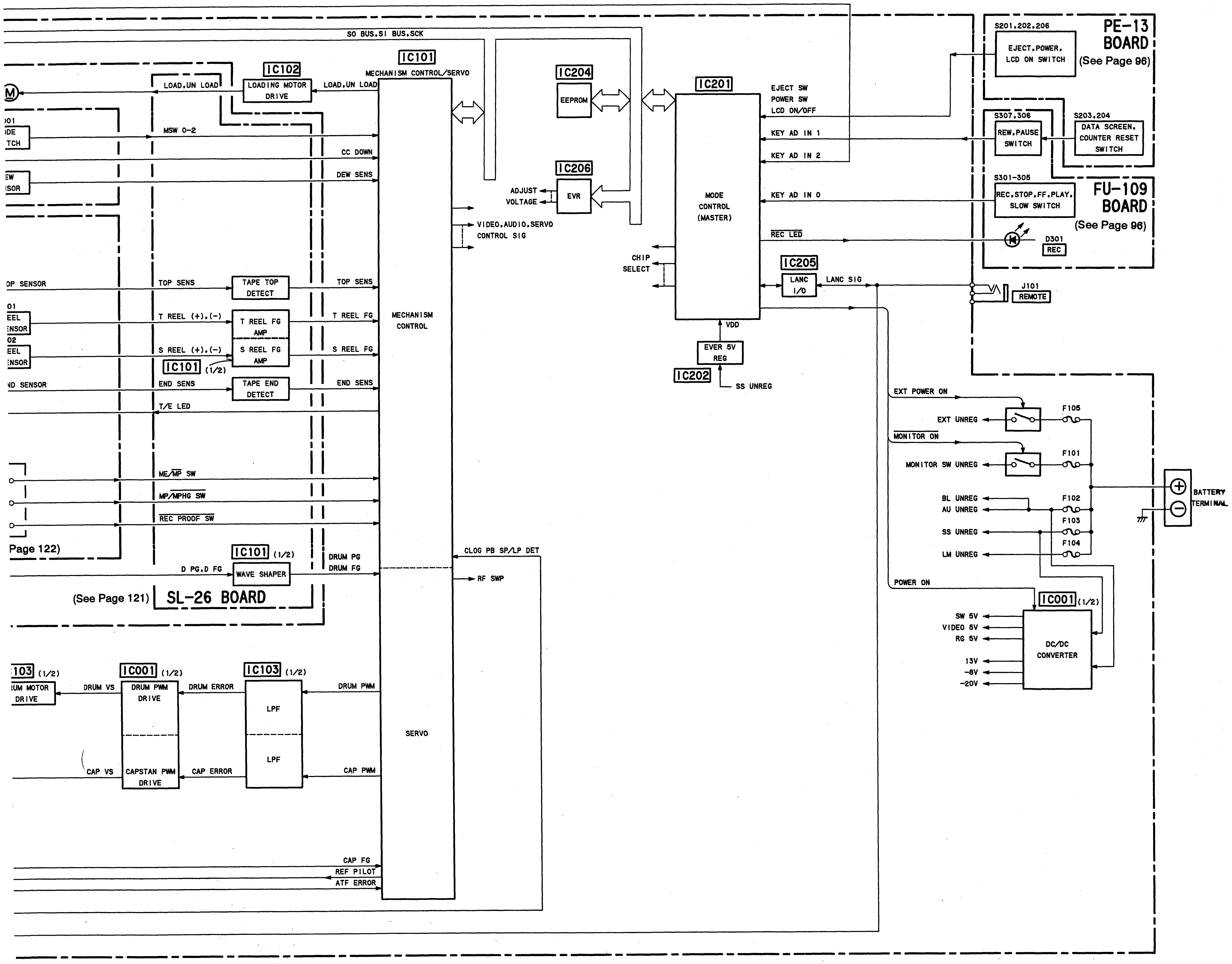

RP-144
(REC/PB head amplifier)
RG-25
(LCD video)
SL-26
(FG/PG waveform shaping)
MA-137
(Video, Servo/System control,
Relay, Power supply)
HP-84
(Headphone jack)
AU-136
(Audio)

TUNER/TIMER UNIT

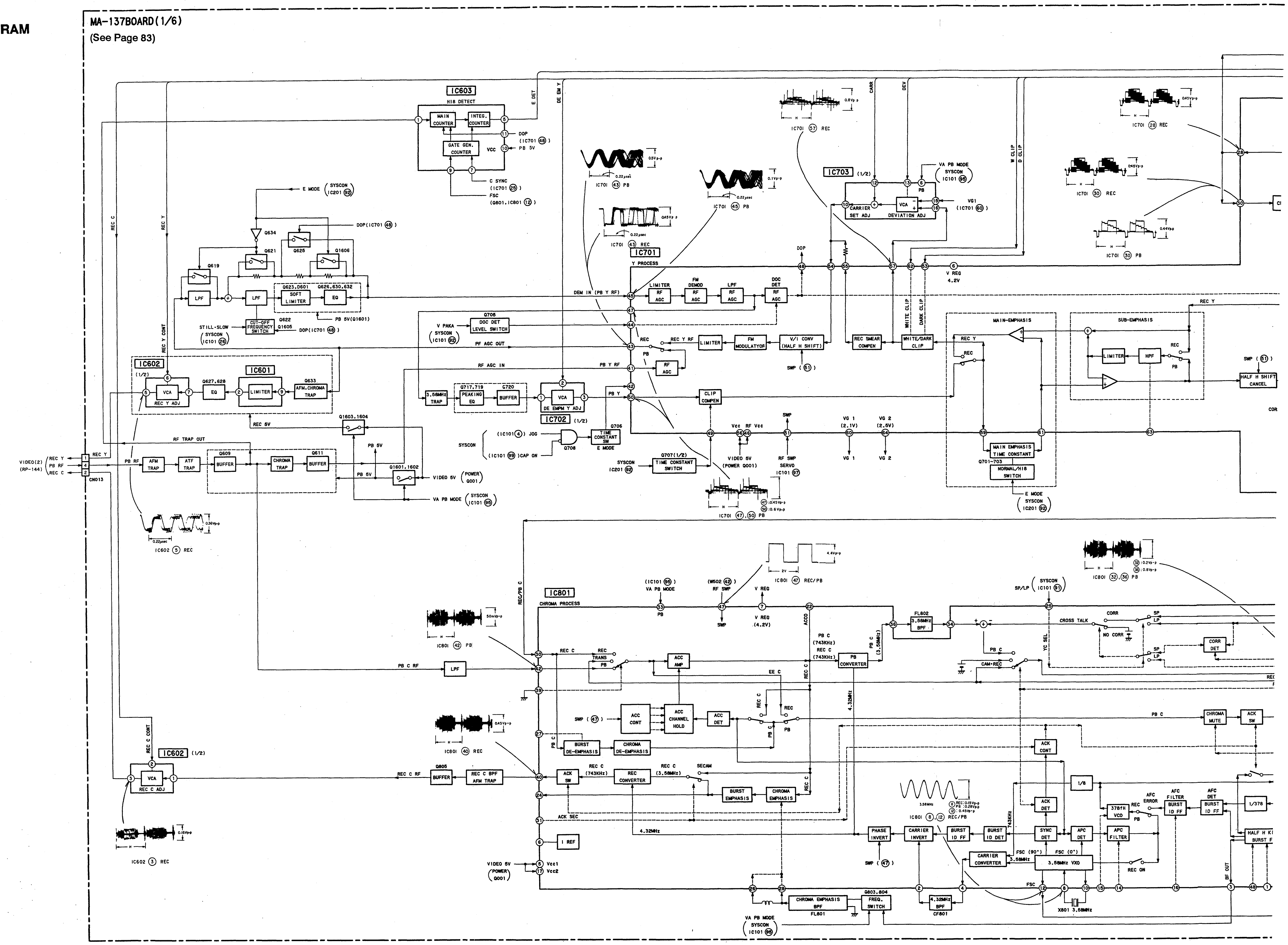

TM-118
(Tuner/Timer control)
TU-142
(Tuner)

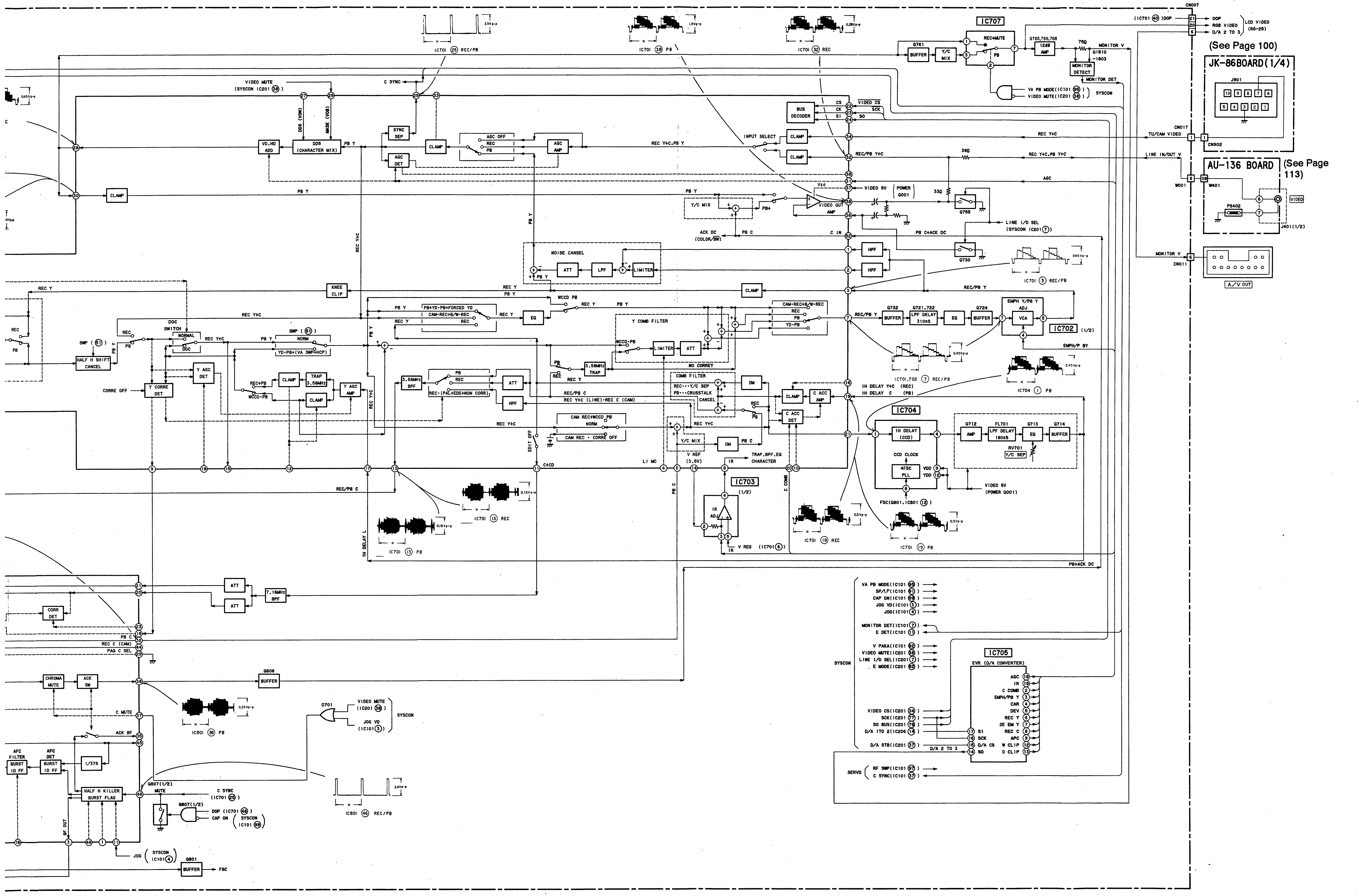
3-2. OVERALL BLOCK DIAGRAM


(See Page 100)
JK-86 BOARD
J901
LANC SIG
TU/CAM VIDEO
TU/CAM AU L.R
MA-137 BOARD
(See Page 83, 93, 97)
EXT UNREG
A/V OUT
MONITOR SW
UNREG
LANC
MONITOR V
MONITOR A L.R
RG-25 BOARD
(See Page 105)
IC901
IC902
RGB VIDEO
RGB DECODER
LCD DRIVE
R
G
B
ADJUST VOLTAGE
VR
VG
VB
IC903
IC906
EVR
CHARACTER GENERATOR
SO BUS.SCK
(See Page 107)
VR-39 BOARD
S501-506
MENU, BRIGHT, VOLUME SWITCH
KEY AD IN 2
LCD PANEL
(See Page 107)
LIQUID CRYSTAL DISPLAY
(See Page 108)
LA-22 BOARD
BACK LIGHT
BL UNREG
BACK LIGHT ON
D/A INVERTER
LA-23 BOARD
(See Page 108)
M903
LOADING MOTOR
S001
MODE SWITCH
S005
CC DOWN
FP-442 BOARD
(See Page 122)
DEW SENSOR
D001
TAPE LED
Q001
TAPE TOP SENSOR
H001
T REEL FG SENSOR
H002
S REEL FG SENSOR
Q002
TAPE END SENSOR
ME/MP
MP/MP-HG
REC PROOF
LS-33 BOARD
(See Page 122)
AU-136 BOARD
(See Page 113)
J401
VIDEO
LINE IN/OUT V
RFU DC OUT
SW 5V
AUDIO
L
R
IC401, IC402
IC404, IC406
AUDIO PROCESS
EXT OUT L.R
TU/CAM AU IN L.R
REC AFM
PB RF
IC091
AUDIO IN/OUT SELECT
IC041
AU HP L.R
HEADPHONE AMP & DBB
IC042
AUDIO POWER AMP
(See Page 99)
HP-84 BOARD
HP L
HP R
HP L.R
LOUD SPEAKER
SP(+)
SP(-)
IC701, IC702
IC703, IC704
IC707, IC601
IC602
TU/CAM VIDEO
RGB VIDEO
MONITOR V
LINE IN OUT V
Y PROCESS
IC603
H18 DETECT
E DIT
Y RF
PB RF
SO BUS.SI BUS.SCK
IC705
ADJUST VOLTAGE
EVR
IC801
C PROCESS
PB C RF
REC C RF
PB RF
REC AFM
REC/PB AMP
1CH A
2CH A
IC1001
RF SWP
FLYING ERASE OSC
FE
(See Page 75)
RP-144 BOARD
CH1
CH2
FLYING ERASE
REC ATF
IC301
ATF SERVO
PB RF
REF PILOT
ATF ERROR
PB SP/LP DET
CLOG DET
D PG, D FG
(See Page 12
M901 DRUM MOTOR
DRUM PG.FG
IC103 (1/2)
DRUM MOTOR DRIVE
DRUM VS
IC
DF
M902 CAPSTAN MOTOR
CAPSTAN FG
IC001
CAPSTAN MOTOR DRIVE
WAVE SHAPER
CFG (+),(-)
CAP FG
CAP VS
CAP

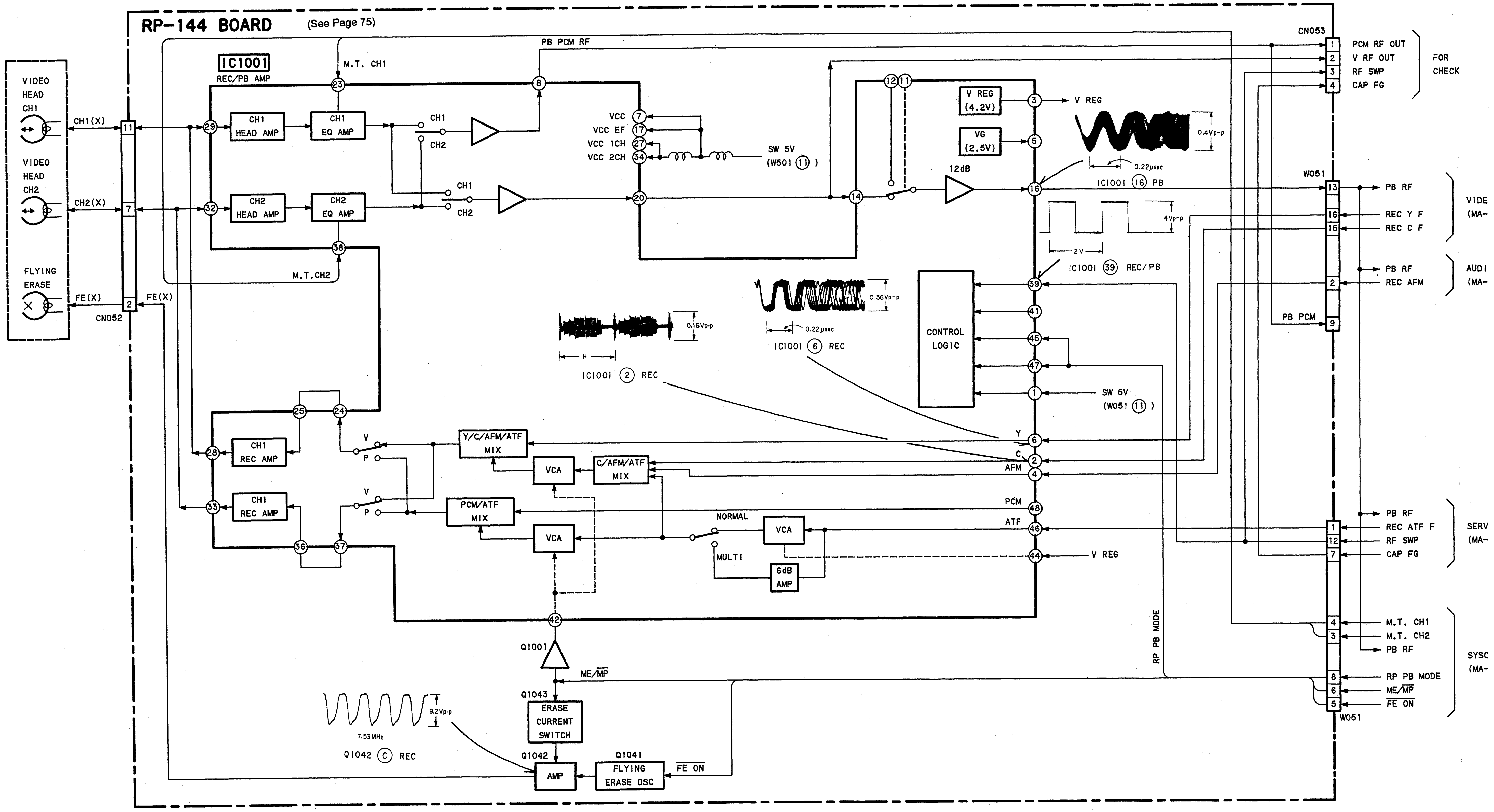

SO BUS,SI BUS,SCK
IC101
MECHANISM CONTROL/SERVO
IC102
LOADING MOTOR DRIVE
LOAD,UN LOAD
LOAD,UN LOAD
M
MSW 0-2
CC DOWN
DEW SENS
TOP SENSOR
TOP SENS
TAPE TOP DETECT
TOP SENS
T REEL (+),(-)
T REEL FG AMP
T REEL FG
S REEL (+),(-)
S REEL FG AMP
S REEL FG
IC101 (1/2)
END SENSOR
END SENS
TAPE END DETECT
END SENS
T/E LED
ME/MP SW
MP/MPHG SW
REC PROOF SW
Page 122)
IC101 (1/2)
D PG,D FG
WAVE SHAPER
DRUM PG
DRUM FG
(See Page 121)
SL-26 BOARD
MECHANISM CONTROL
SERVO
VIDEO,AUDIO,SERVO CONTROL SIG
CLOG PB SP/LP DET
RF SWP
103 (1/2)
DRUM MOTOR DRIVE
DRUM VS
IC001 (1/2)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
CAP VS
DRUM ERROR
CAP ERROR
IC103 (1/2)
LPF
LPF
DRUM PWM
CAP PWM
CAP FG
REF PILOT
ATF ERROR
IC204
EEPROM
IC206
EVR
ADJUST VOLTAGE
IC201
MODE CONTROL (MASTER)
EJECT SW
POWER SW
LCD ON/OFF
KEY AD IN 1
KEY AD IN 2
KEY AD IN 0
REC LED
CHIP SELECT
IC205
LANC I/O
LANC SIG
VDD
EVER 5V REG
IC202
SS UNREG
S201,202,206
EJECT,POWER, LCD ON SWITCH
PE-13 BOARD
(See Page 96)
S307,306
REW,PAUSE SWITCH
S203,204
DATA SCREEN, COUNTER RESET SWITCH
S301-305
REC,STOP,FF,PLAY, SLOW SWITCH
FU-109 BOARD
(See Page 96)
D301
REC
J101
REMOTE
EXT POWER ON
EXT UNREG
F105
MONITOR ON
MONITOR SW UNREG
F101
BL UNREG
AU UNREG
F102
SS UNREG
F103
LM UNREG
F104
BATTERY TERMINAL
POWER ON
IC001 (1/2)
DC/DC CONVERTER
SW 5V
VIDEO 5V
RG 5V
13V
-8V
-20V

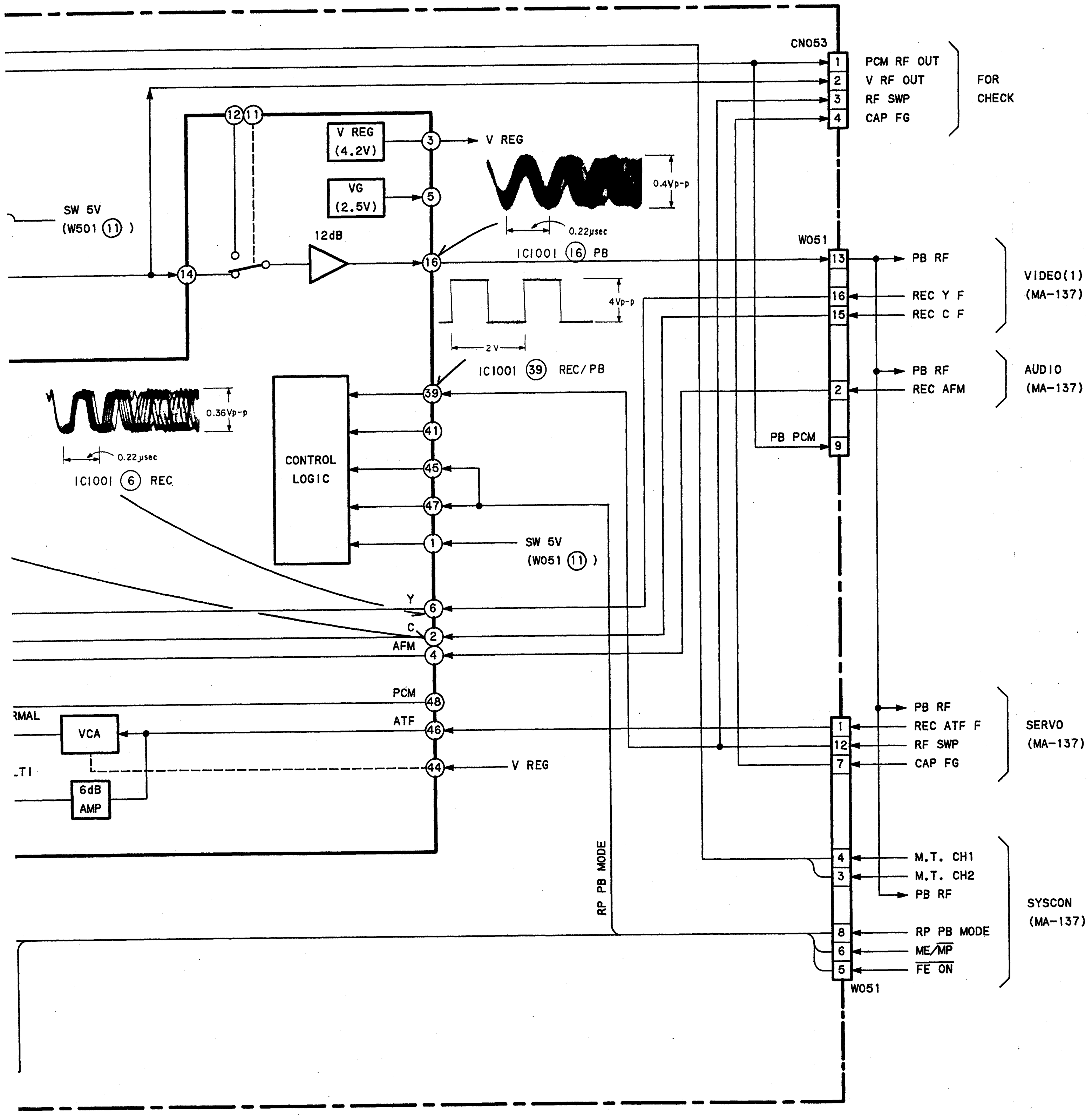
3-3. VIDEO (1) BLOCK DIAGRAM


MA-137BOARD(1/6)
(See Page 83)
IC603
H18 DETECT
MAIN COUNTER
INTEG. COUNTER
GATE GEN. COUNTER
DOP (IC701 48)
PB 5V
VCC
C SYNC (IC701 25)
FSC (Q801, IC801 12)
E MODE (SYSCON IC201 92)
DOP (IC701 48)
Q634
Q621
Q625
Q1606
Q619
LPF
SOFT LIMITER
Q623, D601
Q626, 630, 632
EQ
CUT-OFF FREQUENCY SWITCH
Q622 Q1605
STILL·SLOW (SYSCON IC101 26)
PB 5V (Q1601)
DOP (IC701 48)
REC C
REC Y
REC Y CONT
IC602 (1/2)
VCA
REC Y ADJ
Q627, 628
EQ
IC601
LIMITER
Q633
AFM, CHROMA TRAP
REC 5V
Q1603, 1604
RF TRAP OUT
VIDEO(2) (RP-144)
REC Y
PB RF
REC C
CN013
AFM TRAP
ATF TRAP
Q609 BUFFER
CHROMA TRAP
Q611 BUFFER
PB 5V
Q1601, 1602
VIDEO 5V (POWER Q001)
VA PB MODE (SYSCON IC101 95)
IC602 5 REC
0.36Vp-p
0.22μsec
E DET
DE EM Y
DEM IN (PB Y RF)
IC701
Y PROCESS
LIMITER
RF AGC
FM DEMOD
LPF
DOC DET
DOP
V PAKA (SYSCON IC101 92)
Q705 DOC DET LEVEL SWITCH
PF AGC OUT
RF AGC IN
3.58MHz TRAP
Q717, 719 PEAKING EQ
Q720 BUFFER
IC702 (1/2)
DE EMPH Y ADJ
PB Y RF
PB Y
REC Y RF
FM MODULATOR
V/I CONV (HALF H SHIFT)
SWP (81)
CLIP COMPEN
SYSCON (IC101 4) JOG (IC101 99) CAP ON
Q708
Q706 TIME CONSTANT SW E MODE
SYSCON IC201 92
Q707(1/2) TIME CONSTANT SWITCH
Vcc RF Vcc
VIDEO 5V (POWER Q001)
RF SWP SERVO IC101 97
VG 1 (2.1V)
VG 2 (2.6V)
IC701 47, 50 PB
IC701 43 PB
IC701 45 PB
IC701 43 REC
IC701 57 REC
CARR
DEV
IC703 (1/2)
CARRIER SET ADJ
DEVIATION ADJ
VCA
VA PB MODE (SYSCON IC101 95)
VG1 (IC701 60)
W CLIP
D CLIP
V REG 4.2V
REC SMEAR COMPEN
WHITE/DARK CLIP
WHITE CLIP
DARK CLIP
MAIN-EMPHASIS
SUB-EMPHASIS
LIMITER
HPF
REC Y
HALF H SHIFT CANCEL
MAIN EMPHASIS TIME CONSTANT
Q701-703
NORMAL/H18 SWITCH
E MODE SYSCON IC201 92
IC701 28 REC
IC701 30 REC
IC701 30 PB
REC/PB C
IC801
CHROMA PROCESS
(IC101 95) VA PB MODE
(W502 42) RF SWP
V REG
V REG (4.2V)
IC801 47 REC/PB
IC801 42 PB
PB C RF
LPF
REC C
REC TRANS
PB
ACC AMP
PB C (743KHz)
REC C (743KHz)
PB CONVERTER
FL802 3.58MHz BPF
SP/LP (SYSCON IC101 91)
CROSS TALK
CORR
NO CORR
CORR DET
CAM·REC
YC SEL
ACC CONT
ACC CHANNEL HOLD
ACC DET
EE C
BURST DE-EMPHASIS
CHROMA DE-EMPHASIS
CHROMA MUTE
ACK SW
ACK CONT
IC801 40 REC
IC602 (1/2)
REC C CONT
VCA
REC C ADJ
Q805 BUFFER
REC C RF
REC C BPF AFM TRAP
ACK SW
REC C (743KHz)
REC CONVERTER
REC C (3.58MHz)
SECAM
BURST EMPHASIS
CHROMA EMPHASIS
ACK SEC
4.32MHz
I REF
IC602 3 REC
VIDEO 5V (POWER Q001)
Vcc1
Vcc2
IC801 6, 12 REC/PB
PHASE INVERT
CARRIER INVERT
BURST ID FF
BURST ID DET
SYNC DET
APC DET
APC FILTER
ACK DET
1/8
378fH VCO
AFC ERROR
AFC FILTER
AFC DET BURST ID FF
1/378
HALF H KI BURST F
CARRIER CONVERTER
3.58MHz VXO
FSC (90°)
FSC (0°)
REC ON
FSC
X801 3.58MHz
4.32MHz BPF CF801
CHROMA EMPHASIS BPF FL801
Q803, 804 FREQ. SWITCH
VA PB MODE (SYSCON IC101 95)
BF OUT
IC801 32, 36 PB

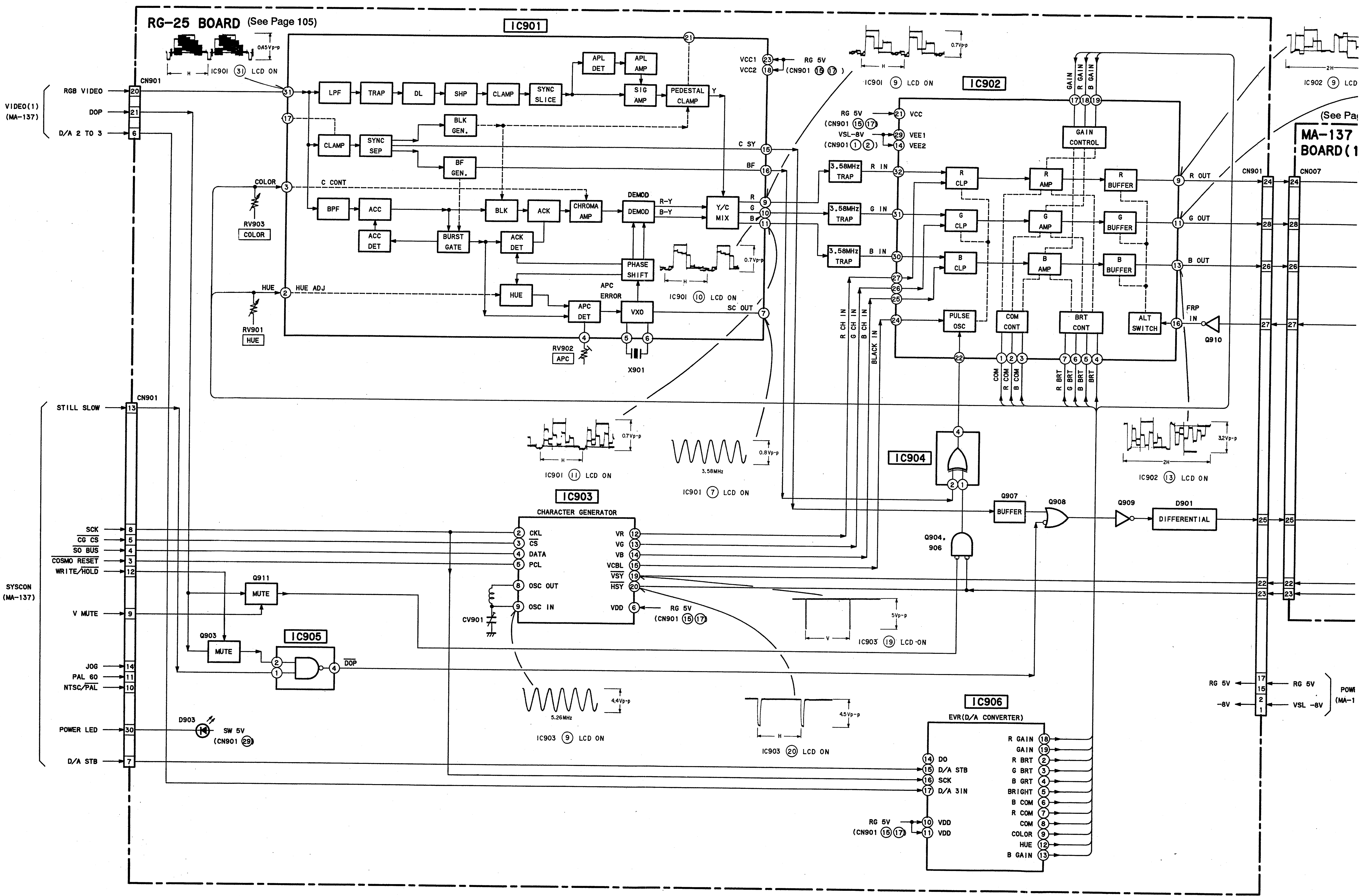

IC701 (25) REC/PB
2.5Vp-p
IC701 (38) PB
1.8Vp-p
IC701 (32) REC
0.28Vp-p
IC707
REC+MUTE
PB
Q761
BUFFER
Y/C MIX
Q765,766,768
12dB AMP
75Ω
MONITOR V
Q1810 -1803
MONITOR DETECT
MONITOR DET
VA PB MODE(IC101 (95))
VIDEO MUTE(IC201 (38))
SYSCON
CN007
(IC701 (40))DOP
DOP
RGB VIDEO
D/A 2 TO 3
LCD VIDEO (RG-25)
(See Page 100)
JK-86BOARD(1/4)
J901
CN017
TU/CAM VIDEO
CN902
LINE IN/OUT V
AU-136 BOARD
(See Page 113)
W001
W401
PS402
J401(1/2)
VIDEO
MONITOR V
CN011
A/V OUT
VIDEO MUTE
(SYSCON IC201 (38))
C SYNC
DDS (VOW)
MASK (VOB)
VD,HD ADD
DDS (CHARACTER MIX)
PB Y
SYNC SEP
CLAMP
AGC DET
AGC OFF
REC
PB
AGC AMP
REC Y+C,PB Y
INPUT SELECT
BUS DECODER
CS
CK
SI
VIDEO CS
SCK
SO
REC Y+C
REC/PB Y+C
39Ω
REC Y+C,PB Y+C
AGC
Vcc
VIDEO 5V
(POWER Q001)
33Ω
Y/C MIX
PB+
VIDEO OUT AMP
Q755
LINE I/O SEL
(SYSCON IC201 (7))
ACK DC
(COLOR/BW)
PB C
C IN
PB C+ACK DC
HPF
Q730
NOISE CANSEL
ATT
LPF
LIMITER
0.45Vp-p
IC701 (3) REC/PB
REC/PB Y
KNEE CLIP
REC Y
WCCD PB
PB+YD·PB+FORCED YD
CAM·REC+B/W·REC
EQ
Y COMB FILTER
WCCD·PB
YD·PB
Q732
BUFFER
Q721,722
LPF DELAY 310nS
Q724
EMPH Y/PB Y ADJ
VCA
IC702 (1/2)
EMPH/P BY
0.45Vp-p
IC701,702 (7) REC/PB
IC704 (1) PB
REC
DOC SWITCH
NORMAL
DOC
SWP ((51))
NORM
YD·PB+(VA SWP+HCP)
HALF H SHIFT CANCEL
Y AGC DET
Y CORRE DET
CORRE OFF
REC+PB
TRAP 3.58MHz
Y AGC AMP
3.58MHz BPF
REC·(PAL+EDE+NON CORR)
3.58MHz TRAP
NO CORREY
COMB FILTER
REC···Y/C SEP
PB···CROSSTALK CANCEL
DM
REC/PB C
REC Y+C (LINE)·REC C (CAM)
CAM REC+WCCD PB
NORM
CAM REC · CORRE OFF
EDIT OFF
C ACC AMP
C ACC DET
1H DELAY Y+C (REC)
1H DELAY C (PB)
IC704
1H DELAY (CCD)
CCD CLOCK
4FSC PLL
VDD
YDD
Q712
AMP
FL701
LPF DELAY 180nS
Q713
Q714
RV701
Y/C SEP
VIDEO 5V
(POWER Q001)
FSC(Q801,IC801 (12))
C+CD
LI MC
V REF (3.5V)
IR
TRAP.BPF.EQ CHARACTER
C COMB
PB C
IC703 (1/2)
IR ADJ
V REG (IC701 (6))
0.15Vp-p
IC701 (13) REC
0.18Vp-p
IC701 (13) PB
1H DELAY L
0.5Vp-p
IC701 (19) REC
IC701 (19) PB
PB+ACK DC
7.16MHz BPF
CORR DET
PB C
REC C (CAM)
PAQ C SEL
Q806
CHROMA MUTE
ACK SW
0.25Vp-p
IC801 (38) PB
C MUTE
ACK BF
D701
VIDEO MUTE (IC201 (38))
JOG VD (IC101 (3))
SYSCON
AFC FILTER
BURST ID FF
AFC DET
1/378
HALF H KILLER
BURST FLAG
Q807(1/2)
MUTE
C SYNC (IC701 (25))
DOP (IC701 (48))
CAP ON (SYSCON IC101 (99))
BF OUT
JOG (SYSCON IC101 (4))
Q801
FSC
2.4Vp-p
IC801 (46) REC/PB
SYSCON
VA PB MODE(IC101 (95))
SP/LP(IC101 (91))
CAP ON(IC101 (99))
JOG VD(IC101 (3))
JOG(IC101 (4))
MONITOR DET(IC101 (7))
E DET(IC101 (11))
V PAKA(IC101 (92))
VIDEO MUTE(IC201 (38))
LINE I/O SEL(IC201 (7))
E MODE(IC201 (92))
VIDEO CS(IC201 (34))
SCK(IC201 (77))
SO BUS(IC201 (76))
D/A 1TO 2(IC206 (14))
D/A STB(IC201 (37))
D/A 2 TO 3
IC705
EVR (D/A CONVERTER)
AGC
IR
C COMB
EMPH/PB Y
CAR
DEV
REC Y
DE EM Y
REC C
APC
W CLIP
D CLIP
S1
SCK
D/A CS
SO
SERVO
RF SWP(IC101 (97))
C SYNC(IC101 (37))

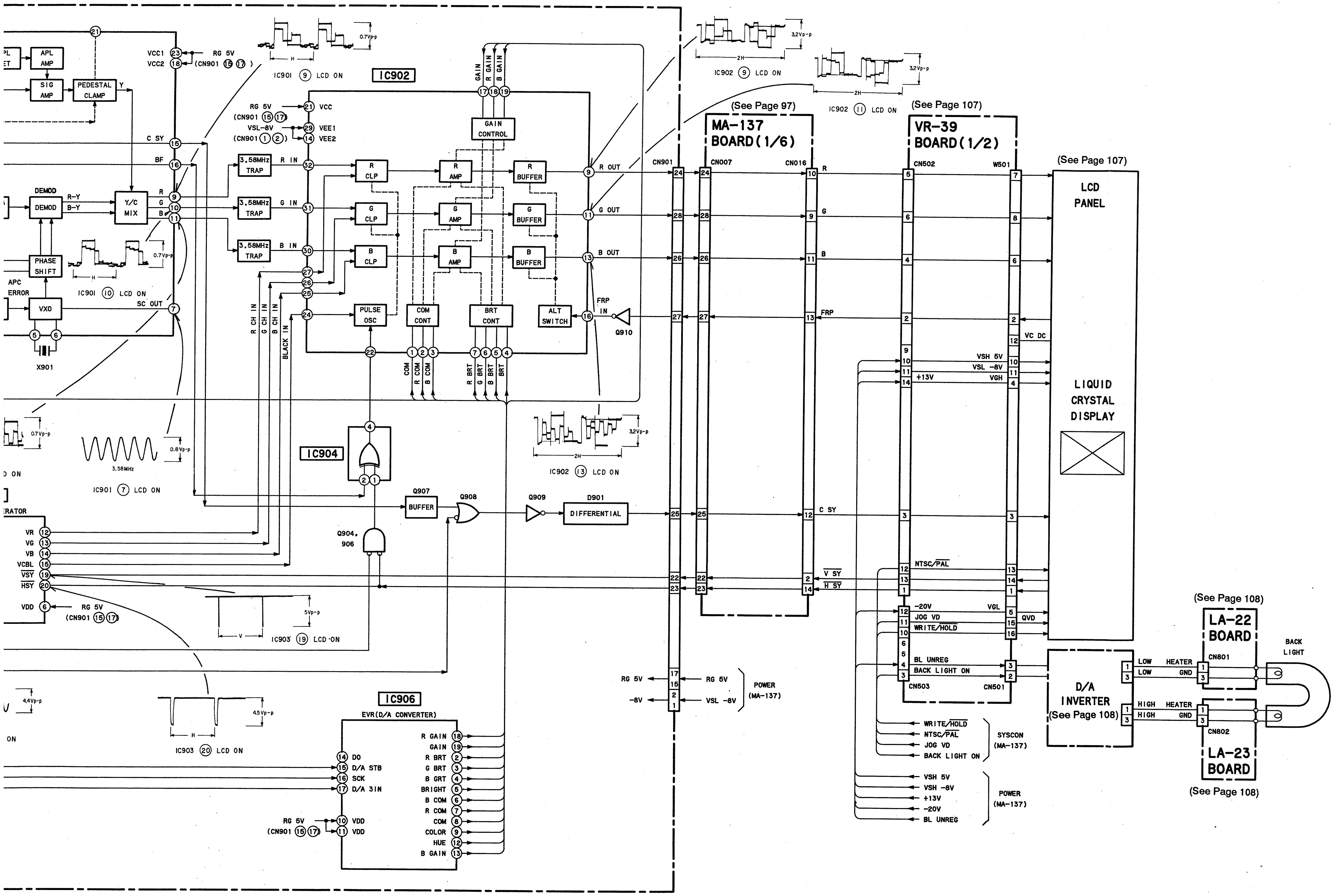
3-4. VIDEO (2) BLOCK DIAGRAM


RP-144 BOARD
(See Page 75)
IC1001
REC/PB AMP
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
CH1(X)
CH2(X)
FE(X)
FE(X)
CN052
PB PCM RF
M.T. CH1
M.T.CH2
CH1 HEAD AMP
CH2 HEAD AMP
CH1 EQ AMP
CH2 EQ AMP
CH1
CH2
VCC
VCC EF
VCC 1CH
VCC 2CH
SW 5V
(W501 ⑪)
V REG (4.2V)
VG (2.5V)
V REG
12dB
0.4Vp-p
0.22μsec
IC1001 ⑯ PB
4Vp-p
2V
IC1001 ㊴ REC/PB
0.36Vp-p
0.22μsec
IC1001 ⑥ REC
0.16Vp-p
H
IC1001 ② REC
CONTROL LOGIC
SW 5V
(W051 ⑪)
Y
C
AFM
PCM
ATF
V REG
CH1 REC AMP
CH2 REC AMP
V
P
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
PCM/ATF MIX
VCA
NORMAL
MULTI
6dB AMP
Q1001
ME/MP
Q1043
ERASE CURRENT SWITCH
Q1042
AMP
Q1041
FLYING ERASE OSC
FE ON
9.2Vp-p
7.53MHz
Q1042 Ⓒ REC
RP PB MODE
CN053
PCM RF OUT
V RF OUT
RF SWP
CAP FG
FOR CHECK
W051
PB RF
REC Y F
REC C F
VIDE
(MA-
PB RF
REC AFM
AUDI
(MA-
PB PCM
PB RF
REC ATF F
RF SWP
CAP FG
SERV
(MA-
M.T. CH1
M.T. CH2
PB RF
RP PB MODE
ME/MP
FE ON
SYSC
(MA-
W051

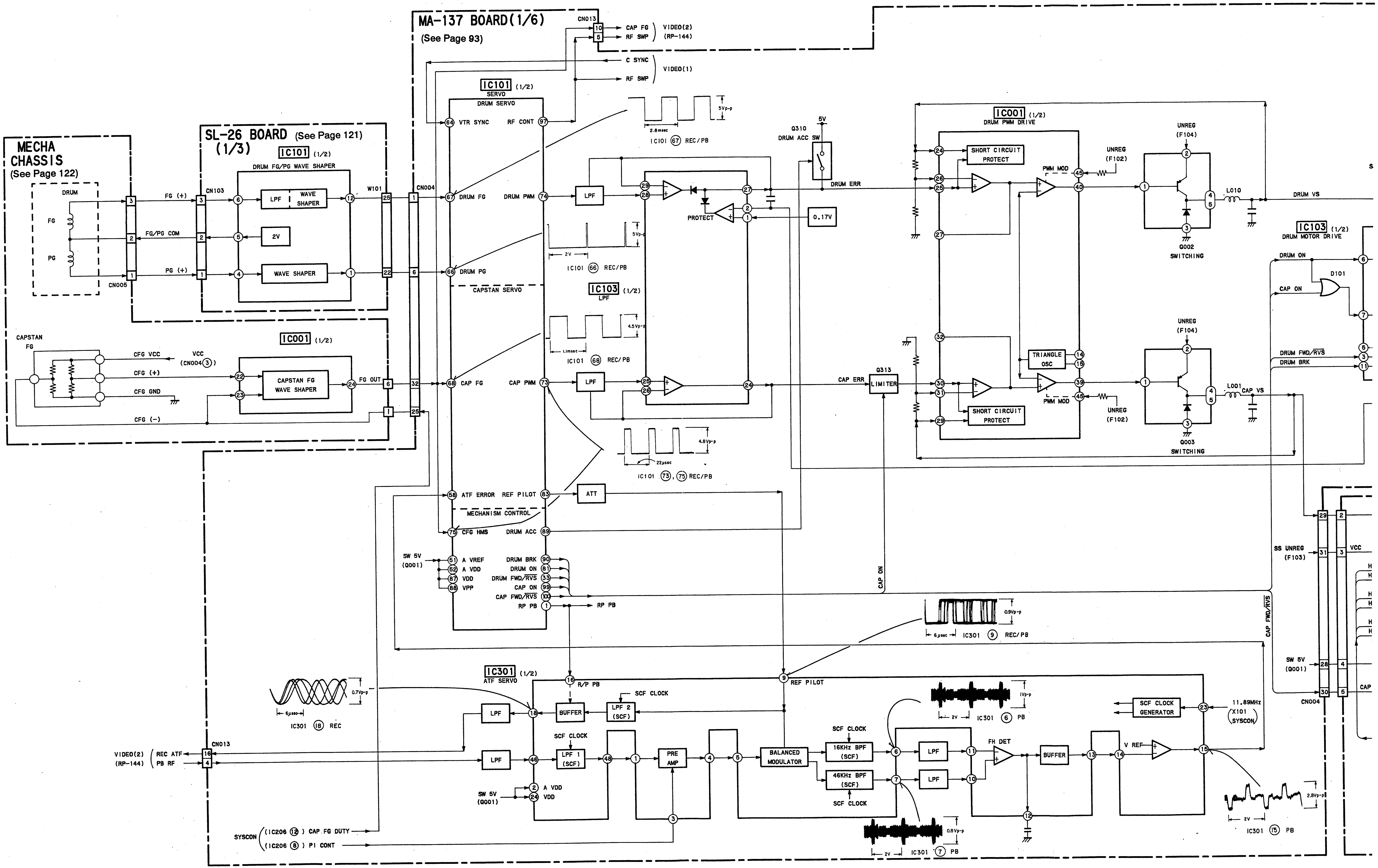

CN053
1 PCM RF OUT
2 V RF OUT
3 RF SWP
4 CAP FG
FOR CHECK
V REG (4.2V)
3
V REG
VG (2.5V)
5
0.4Vp-p
0.22μsec
IC1001 16 PB
SW 5V (W501 11)
12 11
12dB
14
16
4Vp-p
2V
IC1001 39 REC/PB
W051
13 PB RF
16 REC Y F
15 REC C F
VIDEO(1) (MA-137)
PB RF
2 REC AFM
AUDIO (MA-137)
PB PCM
9
0.36Vp-p
0.22μsec
IC1001 6 REC
CONTROL LOGIC
39
41
45
47
1
SW 5V (W051 11)
Y
6
C
2
AFM
4
PCM
48
ATF
46
44
V REG
RMAL
VCA
TI
6dB AMP
PB RF
1 REC ATF F
12 RF SWP
7 CAP FG
SERVO (MA-137)
RP PB MODE
4 M.T. CH1
3 M.T. CH2
PB RF
8 RP PB MODE
6 ME/MP
5 FE ON
SYSCON (MA-137)
W051

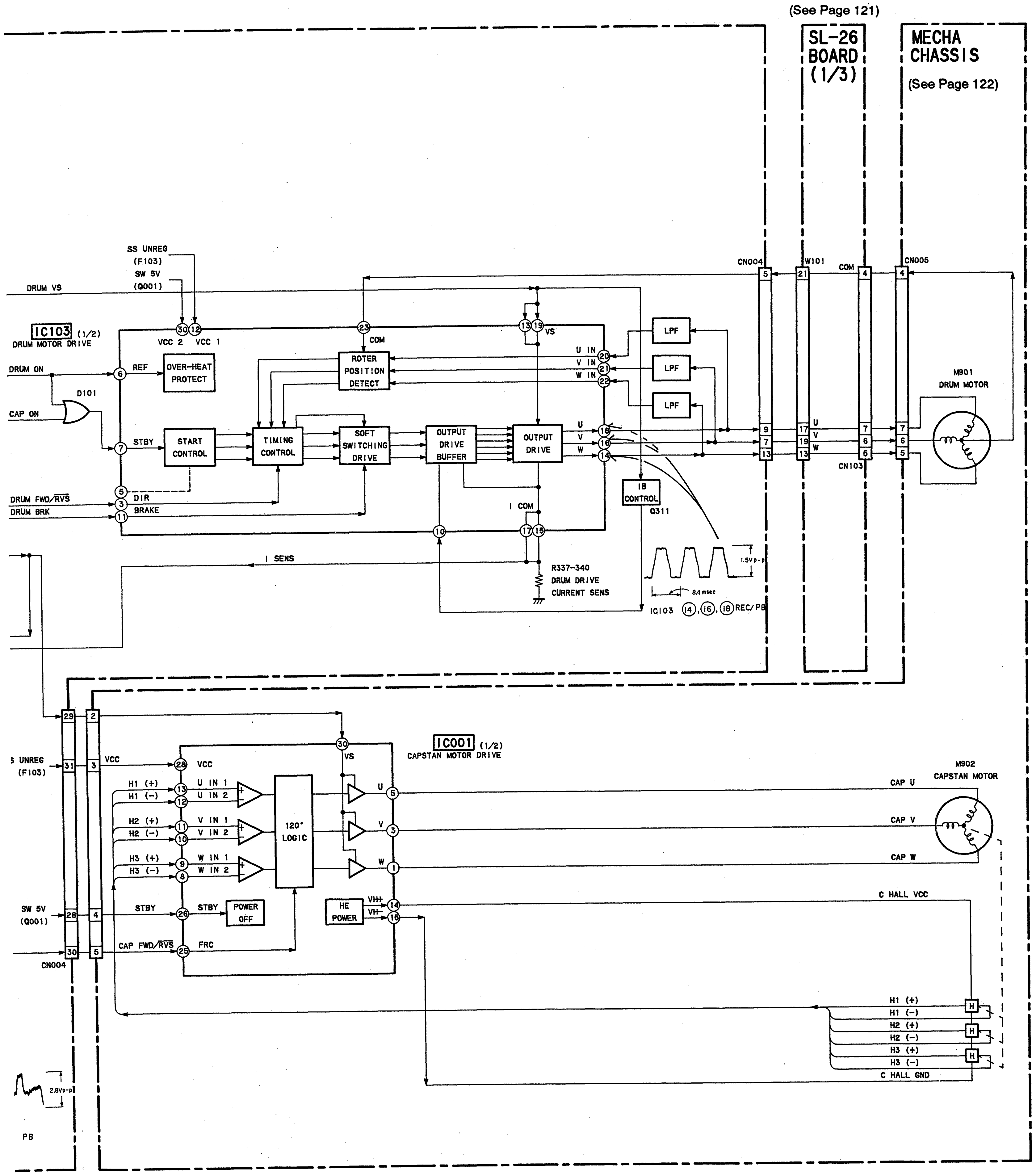
3-5. LCD BLOCK DIAGRAM


RG-25 BOARD (See Page 105)
IC901
0.45Vp-p
H
IC901 (31) LCD ON
VIDEO(1) (MA-137)
RGB VIDEO
DOP
D/A 2 TO 3
CN901
LPF
TRAP
DL
SHP
CLAMP
SYNC SLICE
APL DET
APL AMP
SIG AMP
PEDESTAL CLAMP
Y
BLK GEN.
CLAMP
SYNC SEP
BF GEN.
C SY
BF
COLOR
C CONT
RV903
COLOR
BPF
ACC
ACC DET
BURST GATE
BLK
ACK
ACK DET
CHROMA AMP
DEMOD
DEMOD
R-Y
B-Y
Y/C MIX
R
G
B
PHASE SHIFT
HUE
HUE ADJ
RV901
HUE
HUE
APC DET
APC ERROR
VXO
SC OUT
RV902
APC
X901
VCC1
VCC2
RG 5V
(CN901 (15) (17))
0.7Vp-p
IC901 (9) LCD ON
IC902
RG 5V
(CN901 (15) (17))
VSL-8V
(CN901 (1) (2))
VCC
VEE1
VEE2
3.58MHz TRAP
R IN
G IN
B IN
R CLP
G CLP
B CLP
GAIN
R GAIN
B GAIN
GAIN CONTROL
R AMP
G AMP
B AMP
R BUFFER
G BUFFER
B BUFFER
R OUT
G OUT
B OUT
PULSE OSC
COM CONT
BRT CONT
ALT SWITCH
FRP IN
Q910
R CH IN
G CH IN
B CH IN
BLACK IN
COM
R COM
B COM
R BRT
G BRT
B BRT
BRT
IC901 (10) LCD ON
0.7Vp-p
IC902 (9) LCD
2H
(See Pa
MA-137 BOARD (1
CN901
CN007
IC901 (11) LCD ON
0.7Vp-p
0.8Vp-p
3.58MHz
IC901 (7) LCD ON
IC904
3.2Vp-p
2H
IC902 (13) LCD ON
Q907
BUFFER
Q908
Q909
D901
DIFFERENTIAL
Q904, 906
STILL SLOW
SYSCON (MA-137)
SCK
CG CS
SO BUS
COSMO RESET
WRITE/HOLD
V MUTE
JOG
PAL 60
NTSC/PAL
POWER LED
D/A STB
IC903
CHARACTER GENERATOR
CKL
CS
DATA
PCL
OSC OUT
OSC IN
VR
VG
VB
VCBL
VSY
HSY
VDD
RG 5V
(CN901 (15) (17))
CV901
Q911
MUTE
Q903
MUTE
IC905
DOP
5Vp-p
V
IC903 (19) LCD ON
D903
SW 5V
(CN901 (29))
4.4Vp-p
5.26MHz
IC903 (9) LCD ON
4.5Vp-p
H
IC903 (20) LCD ON
IC906
EVR(D/A CONVERTER)
DO
D/A STB
SCK
D/A 3IN
VDD
VDD
RG 5V
(CN901 (15) (17))
R GAIN
GAIN
R BRT
G BRT
B GRT
BRIGHT
B COM
R COM
COM
COLOR
HUE
B GAIN
RG 5V
-8V
RG 5V
VSL -8V
POW
(MA-1

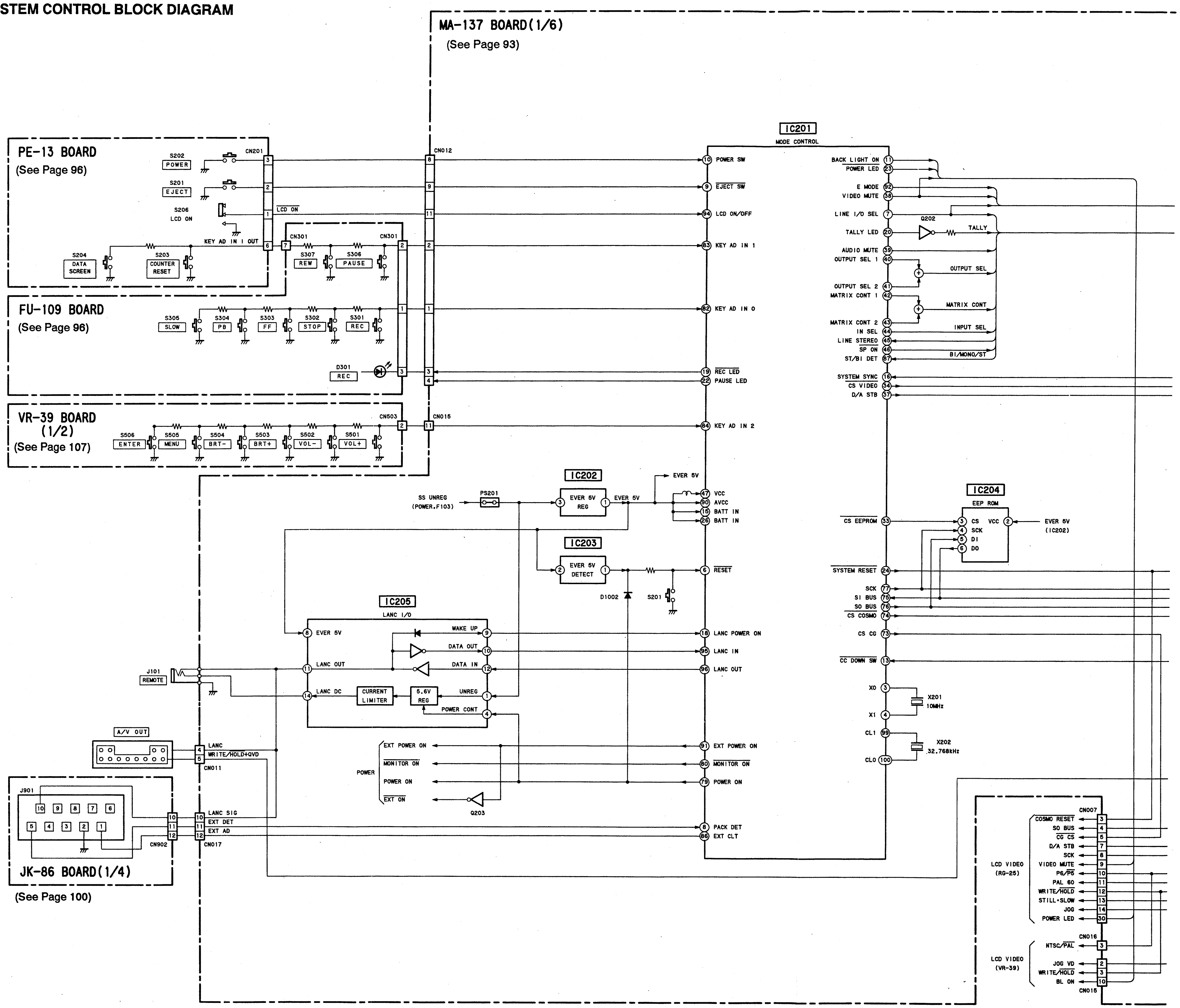

IC902
IC904
IC906
EVR(D/A CONVERTER)
APL AMP
SIG AMP
PEDESTAL CLAMP
DEMOD
Y/C MIX
PHASE SHIFT
VXO
X901
APC ERROR
VCC1
VCC2
RG 5V
C SY
BF
SC OUT
3.58MHz TRAP
R IN
G IN
B IN
R CLP
G CLP
B CLP
R AMP
G AMP
B AMP
R BUFFER
G BUFFER
B BUFFER
GAIN CONTROL
R GAIN
G GAIN
B GAIN
PULSE OSC
COM CONT
BRT CONT
ALT SWITCH
R OUT
G OUT
B OUT
FRP IN
Q910
VCC
VEE1
VEE2
VSL -8V
R CH IN
G CH IN
B CH IN
BLACK IN
R COM
G COM
B COM
R BRT
G BRT
B BRT
BRT
IC901 ⑨ LCD ON
IC901 ⑩ LCD ON
IC901 ⑦ LCD ON
IC902 ⑨ LCD ON
IC902 ⑪ LCD ON
IC902 ⑬ LCD ON
IC903 ⑲ LCD ON
IC903 ⑳ LCD ON
0.7Vp-p
0.8Vp-p
3.2Vp-p
4.4Vp-p
4.5Vp-p
5Vp-p
3.58MHz
H
2H
V
Q907 BUFFER
Q908
Q909
D901 DIFFERENTIAL
Q904, 906
VR
VG
VB
VCBL
VSY
HSY
VDD
D0
D/A STB
SCK
D/A 3IN
BRIGHT
COM
COLOR
HUE
CN901
(See Page 97)
MA-137 BOARD (1/6)
CN007
CN016
(See Page 107)
VR-39 BOARD (1/2)
CN502
W501
CN503
CN501
LCD PANEL
LIQUID CRYSTAL DISPLAY
R
G
B
FRP
C SY
V SY
H SY
VC DC
VSH 5V
VSL -8V
+13V
VGH
NTSC/PAL
-20V
VGL
JOG VD
WRITE/HOLD
QVD
BL UNREG
BACK LIGHT ON
SYSCON (MA-137)
POWER (MA-137)
VSH -8V
RG 5V
-8V
VSL -8V
D/A INVERTER
(See Page 108)
LOW
HIGH
HEATER
GND
LA-22 BOARD
CN801
LA-23 BOARD
CN802
BACK LIGHT

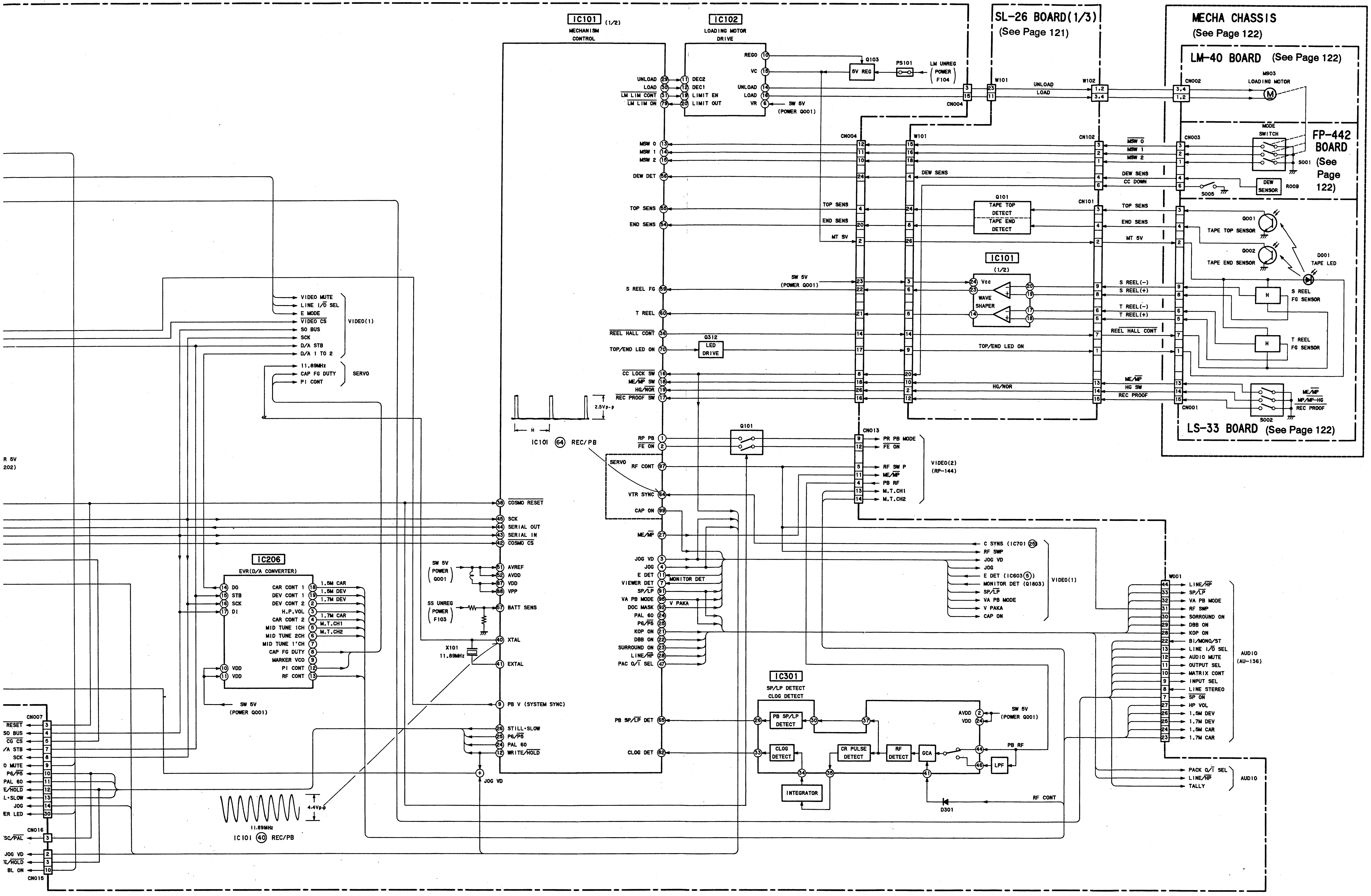
3-6. SERVO BLOCK DIAGRAM


MECHA CHASSIS
(See Page 122)
DRUM
FG
PG
CN005
CAPSTAN FG
SL-26 BOARD (1/3) (See Page 121)
IC101 (1/2)
DRUM FG/PG WAVE SHAPER
CN103
FG (+)
FG/PG COM
PG (+)
LPF
WAVE SHAPER
2V
W101
IC001 (1/2)
CFG VCC
VCC (CN004 ③)
CFG (+)
CFG GND
CFG (−)
CAPSTAN FG WAVE SHAPER
FG OUT
MA-137 BOARD (1/6)
(See Page 93)
CN013
CN004
CAP FG
RF SWP
VIDEO(2) (RP-144)
C SYNC
RF SWP
VIDEO(1)
IC101 (1/2)
SERVO
DRUM SERVO
VTR SYNC
RF CONT
DRUM FG
DRUM PWM
DRUM PG
CAPSTAN SERVO
CAP FG
CAP PWM
ATF ERROR
REF PILOT
MECHANISM CONTROL
CFG HMS
DRUM ACC
SW 5V (Q001)
A VREF
A VDD
VDD
VPP
DRUM BRK
DRUM ON
DRUM FWD/RVS
CAP ON
CAP FWD/RVS
RP PB
5Vp-p
2.8msec
IC101 ⑥⑦ REC/PB
5Vp-p
2V
IC101 ⑥⑥ REC/PB
IC103 (1/2)
LPF
4.5Vp-p
1.1msec
IC101 ⑥⑧ REC/PB
4.8Vp-p
22μsec
IC101 ⑦③, ⑦⑤ REC/PB
PROTECT
0.17V
ATT
5V
Q310
DRUM ACC SW
DRUM ERR
CAP ERR
Q313
LIMITER
CAP ON
IC001 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT PROTECT
PWM MOD
UNREG (F102)
TRIANGLE OSC
UNREG (F104)
Q002 SWITCHING
Q003 SWITCHING
L010
L001
DRUM VS
CAP VS
IC103 (1/2)
DRUM MOTOR DRIVE
DRUM ON
CAP ON
D101
DRUM FWD/RVS
DRUM BRK
SS UNREG (F103)
VCC
SW 5V (Q001)
CAP FWD/RVS
CN004
CAP
0.9Vp-p
6μsec
IC301 ⑨ REC/PB
IC301 (1/2)
ATF SERVO
R/P PB
REF PILOT
SCF CLOCK
LPF
BUFFER
LPF 2 (SCF)
LPF 1 (SCF)
PRE AMP
BALANCED MODULATOR
16KHz BPF (SCF)
46KHz BPF (SCF)
FH DET
V REF
SCF CLOCK GENERATOR
11.89MHz (X101 SYSCON)
0.7Vp-p
6μsec
IC301 ⑱ REC
VIDEO(2) (RP-144)
REC ATF
PB RF
CN013
SW 5V (Q001)
A VDD
VDD
SYSCON
(IC206 ⑫) CAP FG DUTY
(IC206 ⑧) PI CONT
1Vp-p
2V
IC301 ⑥ PB
0.8Vp-p
2V
IC301 ⑦ PB
2.8Vp-p
2V
IC301 ⑮ PB


(See Page 121)
SL-26 BOARD (1/3)
MECHA CHASSIS
(See Page 122)
SS UNREG
(F103)
SW 5V
(Q001)
DRUM VS
IC103 (1/2)
DRUM MOTOR DRIVE
VCC 2
VCC 1
COM
VS
DRUM ON
REF
OVER-HEAT PROTECT
ROTER POSITION DETECT
U IN
V IN
W IN
LPF
LPF
LPF
D101
CAP ON
STBY
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
U
V
W
DRUM FWD/RVS
DRUM BRK
DIR
BRAKE
I COM
IB CONTROL
Q311
I SENS
R337-340
DRUM DRIVE
CURRENT SENS
1.5Vp-p
8.4msec
IC103 ⑭,⑯,⑱ REC/PB
CN004
W101
COM
CN005
CN103
U
V
W
M901
DRUM MOTOR
S UNREG
(F103)
VCC
IC001 (1/2)
CAPSTAN MOTOR DRIVE
VS
VCC
H1 (+)
H1 (−)
U IN 1
U IN 2
H2 (+)
H2 (−)
V IN 1
V IN 2
H3 (+)
H3 (−)
W IN 1
W IN 2
120° LOGIC
U
V
W
M902
CAPSTAN MOTOR
CAP U
CAP V
CAP W
SW 5V
(Q001)
STBY
STBY
POWER OFF
HE POWER
VH+
VH−
C HALL VCC
CAP FWD/RVS
FRC
CN004
H1 (+)
H1 (−)
H2 (+)
H2 (−)
H3 (+)
H3 (−)
C HALL GND
2.8Vp-p
PB

3-7. SYSTEM CONTROL BLOCK DIAGRAM


MA-137 BOARD(1/6)
(See Page 93)
PE-13 BOARD
(See Page 96)
S202 POWER
S201 EJECT
S206 LCD ON
CN201
LCD ON
KEY AD IN 1 OUT
S204 DATA SCREEN
S203 COUNTER RESET
CN301
S307 REW
S306 PAUSE
FU-109 BOARD
(See Page 96)
S305 SLOW
S304 PB
S303 FF
S302 STOP
S301 REC
D301 REC
VR-39 BOARD (1/2)
(See Page 107)
CN503
S506 ENTER
S505 MENU
S504 BRT-
S503 BRT+
S502 VOL-
S501 VOL+
CN012
CN015
IC201
MODE CONTROL
POWER SW
EJECT SW
LCD ON/OFF
KEY AD IN 1
KEY AD IN 0
REC LED
PAUSE LED
KEY AD IN 2
BACK LIGHT ON
POWER LED
E MODE
VIDEO MUTE
LINE I/O SEL
Q202
TALLY LED
TALLY
AUDIO MUTE
OUTPUT SEL 1
OUTPUT SEL
OUTPUT SEL 2
MATRIX CONT 1
MATRIX CONT
MATRIX CONT 2
IN SEL
INPUT SEL
LINE STEREO
SP ON
ST/BI DET
BI/MONO/ST
SYSTEM SYNC
CS VIDEO
D/A STB
IC202
EVER 5V REG
EVER 5V
SS UNREG (POWER,F103)
PS201
VCC
AVCC
BATT IN
BATT IN
IC203
EVER 5V DETECT
RESET
D1002
S201
IC204
EEP ROM
CS EEPROM
CS VCC
SCK
DI
DO
EVER 5V (IC202)
SYSTEM RESET
SCK
SI BUS
SO BUS
CS COSMO
CS CG
CC DOWN SW
X0
X1
X201 10MHz
CL1
CL0
X202 32.768kHz
IC205
LANC I/O
EVER 5V
WAKE UP
DATA OUT
DATA IN
LANC OUT
LANC DC
CURRENT LIMITER
5.6V REG
UNREG
POWER CONT
LANC POWER ON
LANC IN
LANC OUT
J101 REMOTE
A/V OUT
LANC
WRITE/HOLD+QVD
CN011
POWER
EXT POWER ON
MONITOR ON
POWER ON
EXT ON
Q203
EXT POWER ON
MONITOR ON
POWER ON
J901
CN902
JK-86 BOARD(1/4)
(See Page 100)
LANC SIG
EXT DET
EXT AD
CN017
PACK DET
EXT CLT
CN007
COSMO RESET
SO BUS
CG CS
D/A STB
SCK
VIDEO MUTE
P6/P5
PAL 60
WRITE/HOLD
STILL•SLOW
JOG
POWER LED
LCD VIDEO (RG-25)
CN016
NTSC/PAL
LCD VIDEO (VR-39)
JOG VD
WRITE/HOLD
BL ON
CN015



IC101 (1/2)
MECHANISM CONTROL
IC102
LOADING MOTOR DRIVE
SL-26 BOARD(1/3)
(See Page 121)
MECHA CHASSIS
(See Page 122)
LM-40 BOARD (See Page 122)
FP-442 BOARD (See Page 122)
LS-33 BOARD (See Page 122)
M903 LOADING MOTOR
MODE SWITCH
S001
S005
DEW SENSOR
R009
Q001 TAPE TOP SENSOR
Q002 TAPE END SENSOR
D001 TAPE LED
S REEL FG SENSOR
T REEL FG SENSOR
S002
ME/MP
MP/MP-HG
REC PROOF
CN001
CN002
CN003
CN004
CN013
CN101
CN102
W101
W102
W001
Q103
5V REG
PS101
LM UNREG POWER F104
UNLOAD
LOAD
LM LIM CONT
LM LIM ON
DEC2
DEC1
LIMIT EN
LIMIT OUT
REGO
VC
VR
SW 5V (POWER Q001)
MSW 0
MSW 1
MSW 2
DEW DET
DEW SENS
CC DOWN
TOP SENS
END SENS
MT 5V
Q101
TAPE TOP DETECT
TAPE END DETECT
IC101 (1/2)
Vcc
WAVE SHAPER
S REEL FG
T REEL
S REEL(-)
S REEL(+)
T REEL(-)
T REEL(+)
REEL HALL CONT
Q312 LED DRIVE
TOP/END LED ON
CC LOCK SW
ME/MP SW
HG/NOR
HG SW
REC PROOF SW
2.5Vp-p
H
IC101 (64) REC/PB
RP PB
FE ON
Q101
PR PB MODE
FE ON
SERVO
RF CONT
RF SW P
ME/MP
PB RF
M.T.CH1
M.T.CH2
VIDEO(2) (RP-144)
VTR SYNC
CAP ON
VIDEO MUTE
LINE I/O SEL
E MODE
VIDEO CS
SO BUS
SCK
D/A STB
D/A 1 TO 2
VIDEO(1)
11.89MHz
CAP FG DUTY
PI CONT
SERVO
COSMO RESET
SCK
SERIAL OUT
SERIAL IN
COSMO CS
SW 5V Q001
AVREF
AVDD
VDD
VPP
SS UNREG POWER F103
BATT SENS
X101 11.89MHz
XTAL
EXTAL
PB V (SYSTEM SYNC)
STILL·SLOW
P6/P5
PAL 60
WRITE/HOLD
JOG VD
IC206
EVR(D/A CONVERTER)
DO
STB
SCK
DI
VDD
VDD
CAR CONT 1
DEV CONT 1
DEV CONT 2
H.P.VOL
CAR CONT 2
MID TUNE 1CH
MID TUNE 2CH
MID TUNE 1'CH
CAP FG DUTY
MARKER VCO
PI CONT
RF CONT
1.5M CAR
1.5M DEV
1.7M DEV
1.7M CAR
M.T.CH1
M.T.CH2
SW 5V (POWER Q001)
4.4Vp-p
11.89MHz
IC101 (40) REC/PB
JOG VD
JOG
E DET
VIEWER DET
MONITOR DET
SP/LP
VA PB MODE
DOC MASK
V PAKA
PAL 60
P6/P5
KOP ON
DBB ON
SURROUND ON
LINE/HP
PAC O/I SEL
C SYNS (IC701 (25))
RF SWP
JOG VD
JOG
E DET (IC603(5))
MONITOR DET (Q1803)
SP/LP
VA PB MODE
V PAKA
CAP ON
VIDEO(1)
PB SP/LP DET
CLOG DET
IC301
SP/LP DETECT
CLOG DETECT
PB SP/LP DETECT
CLOG DETECT
INTEGRATOR
CR PULSE DETECT
RF DETECT
GCA
LPF
AVDD
VDD
PB RF
RF CONT
D301
LINE/HP
SP/LP
VA PB MODE
RF SWP
SORROUND ON
DBB ON
KOP ON
BI/MONO/ST
LINE I/O SEL
AUDIO MUTE
OUTPUT SEL
MATRIX CONT
INPUT SEL
LINE STEREO
SP ON
HP VOL
1.5M DEV
1.7M DEV
1.5M CAR
1.7M CAR
AUDIO (AU-136)
PACK O/I SEL
LINE/HP
TALLY
AUDIO
CN007
RESET
SO BUS
CG CS
/A STB
SCK
O MUTE
P6/P5
PAL 60
E/HOLD
L·SLOW
JOG
ER LED
CN016
SC/PAL
JOG VD
E/HOLD
BL ON
CN015
R 5V
202)

3-8. MECHANISM CONTROL MICRO PROCESSOR (IC101 on MA-137 Board: CXP80624A) PIN FUNCTIONS

Pin No.	Signal Name	I/O	Function
1	RP PB MODE	O	REC/PB switching signal of REC/PB amplifier and ATF servo IC. "H" when PB.
2	$\overline{\text{FE ON}}$	O	Flying erase oscillation ON/OFF control signal. Oscillation when "L".
3	JOG VD	O	False VD signal inserted into playback video signal during variable speed playback.
4	JOG	O	Variable speed playback/normal playback switching signal of video circuit. "H" during variable speed playback.
5			Not used.
6			
7	VIEWER DET	I	Signal indicating that peripheral equipment is connected to A/V output pin. "H" when peripheral equipment is connected.
8			Not used.
9	PB V	O	Used as the reference for serial data communication, LANC cycle. V sync. Synchronizes with VTR SYNC (Pin (64)).
10			Not used.
11	E DET	I	Normal/Hi8 discrimination input. "H" when playing back a Hi8 tape recorded.
12	WRITE/$\overline{\text{HOLD}}$	O	RGB signal data writing control signal to LCD panel. Normally "H".
13	MODE SW 0	I	MODE switch input.
14	MODE SW 1	I	
15	MODE SW 2	I	
16	$\overline{\text{CC LOCK SW}}$	I	Cassette compartment lock switch input. "L" when lock.
17	REC PROOF SW	I	Record-proof switch input. REC prohibition: "H".
18	ME/$\overline{\text{MP}}$ SW	I	Tape type discrimination switch input. ME: "H", MP: "L".
19	HG/$\overline{\text{NOR}}$	I	MP tape type discrimination switch input. Hi8 MP tape: "H", Normal tape: "L".
20			Not used.
21			
22	DBB ON	O	DBB ON/OFF control signal. DBB ON at "H".
23	SURROUND ON	O	Surround ON/OFF signal. "Surround" ON at "H".
24			Not used.
25			
26	STILL•SLOW	O	Signal indicating that STILL and SLOW playback is being performed. "H" during SILL and SLOW playback.
27	ME/$\overline{\text{MP}}$	O	ME/MP switching signal output. MP tape: "L"
28	LINE/$\overline{\text{HP}}$	O	Switching signal of audio signal output to accessory pack pin. LINE OUT audio: "H", Headphone audio: "L".
29	UNLOAD	O	Loading motor control signal. When unloading: "H" or "H" pulse.
30	LOAD	O	Loading motor control signal. When loading: "H" or "H" pulse.
31	LM LIM CONT	O	Loading motor current limiter control signal. Temporarily "H" when loading.
32			Not used.
33	DRUM FWD/$\overline{\text{REV}}$	O	Drum rotating direction control signal. Normally "H".
34			Not used.
35			
36	$\overline{\text{REEL HALL CONT}}$	O	Power supply control signal of reel FG sensor. "L" pulse when REC/PB.
37	MP	I	Connected to GND.
38	$\overline{\text{COSMO RESET}}$	I	Reset signal. Reset when "L".
39	VSS		GND.
40	XTAL	O	11.89 MHz oscillation circuit output pin.

	EJECT	USE	LOAD	READY	RP	FF
MODE SW 0	0	1	0	1	0	0
MODE SW 1	0	0	0	0	1	0
MODE SW 2	1	1	1	0	0	0

Pin No.	Signal Name	I/O	Function
41	EXTAL	I	11.89 MHz oscillation circuit input pin.
42	$\overline{\text{COSMO CS}}$	I	Chip select signal from mode control micro processor. V cycle "L" pulse.
43	SERIAL IN	I	Serial data input.
44	SERIAL OUT	O	Serial data output.
45	SCK	O	Serial clock output.
46			Not used.
47	PAC O/I SEL	O	Signal which controls the accessory pack pin signal direction. When "H", the signal is output from the main unit to the accessory pack.
48			Not used.
49			
50	AVSS		Analog port GND.
51	AVREF		Analog port reference voltage input (Connected to AVDD).
52	AVDD		Analog port power supply (+5V).
53			Not used.
54	END SENS	I	Tape end detecting signal. Normally "L". "H" pulse at tape end.
55	TOP SENS	I	Tape top detecting signal. Normally "L". "H" pulse at tape top.
56	$\overline{\text{DEW DET}}$	I	Condensation detection signal input. "L" when condensation occurred.
57	BATT SENSE	I	Battery voltage input for battery end detecting. The voltage divided into 2 by R114 and R115 is input.
58	ATF ERROR	I	ATF error, ATF lock error voltage input.
59	S REEL	I	S reel FG signal input.
60	T REEL	I	T reel FG signal input.
61			Not used.
62			
63			
64	VTR SYNC	I	Composite sync signal input separated from recording/playback Y signal.
65	SP/LP DET	I	Recording mode discrimination signal of the tape played back when CUE/REV/FF/REW. "H" when SP tape.
66	DRUM PG	I	Drum PG signal input. For drum phase servo. 33.3 msec. cycle "H" pulse when REC/PB.
67	DRUM FG	I	Drum FG signal input. For drum speed servo. 360 Hz square wave when REC/PB.
68	CAP FG	I	Capstan FG signal input. For capstan speed servo. Approx. 993 Hz in SP mode REC/PB, Approx. 497 Hz in LP mode REC/PB.
69			Not used.
70	TOP/END LED ON	O	LED ON/OFF signal for detecting tape top and end. "H" pulse during tape running.
71			Not used.
72			
73	CAP PWM	O	Capstan error signal output. 20.15 μsec. cycle PWM signal.
74	DRUM PWM	O	Drum error signal output. 20.15 μsec. cycle PWM signal.
75	CFG HMS	I	Capstan FG signal input for tape counter.
76			Not used.
77			
78			
79	$\overline{\text{LM LIM ON}}$	I	Loading motor driver current limiter detecting signal input. Normally "H". "L" when limiter is ON.
80			Not used.
81	DRUM ON	O	Drum motor ON/OFF control signal. Drum rotates at "H".
82	CLOG DET	I	Head clog detecting signal input. Normally "L".
83	REF PILOT	O	Reference pilot signal output for ATF servo. Synchronizes with drum rotation, switches four frequencies sequentially and outputs. f1=102.52 kHz, f2=118.95 kHz, f3=165.21 kHz, f4=148.69 kHz.

Pin No.	Signal Name	I/O	Function
41	EXTAL	I	11.89 MHz oscillation circuit input pin.
42	COSMO CS	I	Chip select signal from mode control micro processor. V cycle “L” pulse.
43	SERIAL IN	I	Serial data input.
44	SERIAL OUT	O	Serial data output.
45	SCK	O	Serial clock output.
46			Not used.
47	PAC O/I SEL	O	Signal which controls the accessory pack pin signal direction. When “H”, the signal is output from the main unit to the accessory pack.
48			Not used.
49			
50	AVSS		Analog port GND.
51	AVREF		Analog port reference voltage input (Connected to AVDD).
52	AVDD		Analog port power supply (+5V).
53			Not used.
54	END SENS	I	Tape end detecting signal. Normally “L”. “H” pulse at tape end.
55	TOP SENS	I	Tape top detecting signal. Normally “L”. “H” pulse at tape top.
56	DEW DET	I	Condensation detection signal input. “L” when condensation occurred.
57	BATT SENSE	I	Battery voltage input for battery end detecting. The voltage divided into 2 by R114 and R115 is input.
58	ATF ERROR	I	ATF error, ATF lock error voltage input.
59	S REEL	I	S reel FG signal input.
60	T REEL	I	T reel FG signal input.
61			Not used.
62			
63			
64	VTR SYNC	I	Composite sync signal input separated from recording/playback Y signal.
65	SP/LP DET	I	Recording mode discrimination signal of the tape played back when CUE/REV/FF/REW. “H” when SP tape.
66	DRUM PG	I	Drum PG signal input. For drum phase servo. 33.3 msec. cycle “H” pulse when REC/PB.
67	DRUM FG	I	Drum FG signal input. For drum speed servo. 360 Hz square wave when REC/PB.
68	CAP FG	I	Capstan FG signal input. For capstan speed servo. Approx. 993 Hz in SP mode REC/PB, Approx. 497 Hz in LP mode REC/PB.
69			Not used.
70	TOP/END LED ON	O	LED ON/OFF signal for detecting tape top and end. “H” pulse during tape running.
71			Not used.
72			
73	CAP PWM	O	Capstan error signal output. 20.15 μsec. cycle PWM signal.
74	DRUM PWM	O	Drum error signal output. 20.15 μsec. cycle PWM signal.
75	CFG HMS	I	Capstan FG signal input for tape counter.
76			Not used.
77			
78			
79	LM LIM ON	I	Loading motor driver current limiter detecting signal input. Normally “H”. “L” when limiter is ON.
80			Not used.
81	DRUM ON	O	Drum motor ON/OFF control signal. Drum rotates at “H”.
82	CLOG DET	I	Head clog detecting signal input. Normally “L”.
83	REF PILOT	O	Reference pilot signal output for ATF servo. Synchronizes with drum rotation, switches four frequencies sequentially and outputs. f1=102.52 kHz, f2=118.95 kHz, f3=165.21 kHz, f4=148.69 kHz.

Pin No.	Signal Name	I/O	Function
84			Not used.
85	NC		Connected to GND.
86	VSS		GND.
87	VDD		+5V power supply.
88	VPP		Connected to VDD.
89	DRUM ACC	O	Drum acceleration pulse output for fH correction. Normally “L”.
90	DRUM BRK	O	Drum deceleration pulse output for fH correction. Normally “L”.
91	SP/LP OUT	O	SP/LP switching signal output. SP: “H”, LP: “L”.
92	DOC MASK	O	DOC level switching signal output. “H” pulse which synchronizes with V sync during PB.
93			Not used.
94			
95	VA PB MODE	O	REC/PB switching signal output of video/audio circuit. “H” when PB.
96			Not used.
97	RF SWP(RF CONT)	O	PF switching pulse signal output. 30 Hz, duty cycle 50%.
98			Not used.
99	CAP ON	O	Capstan motor ON/OFF control signal output. Capstan rotates at “H”.
100	CAP FWD/RVS	O	Capstan rotational direction control signal output. FWD direction: “H”.

-9. MODE CONTROL MICRO PROCESSOR (IC201 on MA-137 board: MB89092) PIN FUNCTIONS

in No.	Signal Name	I/O	Function
1	MOD0		Operation mode specification pin. Connected to GND.
2	MOD1		
3	X0		System clock oscillation circuit. 10 MHz.
4	X1		
5	VSS		GND pin.
6	RESET	I	Reset input. "L" when resetting.
7	LINE I/O SEL	O	Input/output switching signal of line input/output pin. "H" only when external pack is not connected and the mode is not playback (input condition).
8	PACK DET	I	External pack connection signal. Standby switch is used (combined use) when camera pack is connected.
9	EJECT SW	I	Cassette EJECT key input. "L" when key is pressed.
10	POWER SW	I	POWER switch input. "L" when key is pressed.
11	BACK LIGHT ON	O	Liquid crystal display back light ON/OFF signal. "H" when back light ON.
12	START/STOP SW	I	Not used.
13	CC DOWN SW	I	Cassette compartment lock switch input. "L" when lock.
14	CAMERA STBY SW	I	Not used.
15	BATT IN		Fixed at "H" level.
16	SYSTEM SYNC(PB V)	I	VD signal input from mechanism control micro processor. Timing reference of serial data communication. V cycle "L" pulse.
17	SERVO V	I	Not used.
18	LANC POWER ON	I	POWER ON signal input by LANC. "L" when POWER is turned ON.
19	REC LED	O	REC LED ON/OFF signal. REC: "L".
20	TALLY LED	O	Camera Tally LED ON/OFF signal.
21			Not used.
22	PAUSE LED	O	Not used.
23	POWER LED	O	POWER LED ON/OFF signal. Power supply ON: "L".
24	SYSTEM RESET	O	Reset signal to mechanism control micro processor. "L" when resetting.
25	AD GND		For AD reference. Connected to GND.
26	BATT IN		Fixed at "H" level.
27	MARKER SI	I	Not used.
28	MARKER SO	O	
29	MARKER SCK	O	
30	RMC IN	I	
31	MARKER RESET	O	
32	MK REC MASK	O	
33	CS EEPROM	O	Serial data communication chip select signal to EEPROM. V cycle "L" pulse.
34	CS VIDEO	O	Serial data communication chip select signal to VIDEO IC. V cycle "L" pulse.
35	CS MARKER	O	Not used.
36	CS LCD	O	
37	D/A STB	O	D/A converter IC serial data transfer strobe signal. V cycle "H" pulse.
38	VIDEO MUTE	O	Video output mute signal. "H" when muting.
39	AUDIO MUTE	O	Audio output mute signal. "H" when muting.
40	OUTPUT SEL 1	O	Audio monitor switching output.
41	OUTPUT SEL 2	O	

	Stereo	Main	Sub	Main/Sub	Monaural
OUTPUT SEL 1	L	H	H	L	L
OUTPUT SEL 2	L	H	L	L	L

Pin No.	Signal Name	I/O	Function
42	MATRIX CONT 1	O	Audio matrix switching
43	MATRIX CONT 2	O	

	Stereo	Bilingual	Monaural
MATRIX CONT 1	H	H	L
MATRIX CONT 2	H	L	L

Pin No.	Signal Name	I/O	Function
44	INSEL	O	Input switching signal. "H" during line input.
45	LINE STEREO	I	Stereo/monaural discrimination input of line input pin. "H" when plug is inserted in audio input pin (right).
46	SP ON	O	Speaker output ON/OFF signal. Speaker ON: "L".
47	VCC		Power supply pin.
48	SEG15	O	Not used.
49	SEG14	O	
50	SEG13	O	
51	SEG12	O	
52	SEG11	O	
53	SEG10	O	
54	SEG09	O	
55	SEG08	O	
56	VSS		GND pin.
57	SEG07	O	Not used.
58	SEG06	O	
59	SEG05	O	
60	SEG04	O	
61	SEG03	O	
62	SEG02	O	
63	SEG01	O	
64	SEG00	O	
65	V3		
66	V2		
67	V1		
68	V0		
69	COM0	O	
70	COM1	O	
71	COM2	O	
72	COM3	O	
73	CS CG	O	Character generator serial data communication chip select signal. V cycle "L" pulse.
74	CS COSMO	O	Serial data communication chip select signal to mechanism control micro processor. V cycle "L" pulse.
75	SI BUS	I	Serial data communication data input. V cycle "L" pulse row.
76	SO BUS	O	Serial data communication data output. V cycle "L" pulse row.
77	SCK	O	Clock for serial data communication.
78			Not used.
79	POWER ON	O	Power supply ON/OFF control signal. Power supply ON: "H".
80	MONITOR ON	O	External monitor power supply ON/OFF control signal. Power supply ON: "L".
81	AVSS		GND pin.
82	KEY AD IN 0	I	Key input signal. 0V: REC, 0.9V: STOP, 1.5V: FF, 2.2V: PB, 2.8V: SLOW, 5V: No input.
83	KEY AD IN 1	I	Key input signal. 0V: PAUSE, 0.9V: REW, 1.5V: COUNTER RESET, 2.2V: DATA SCREEN, 5V: No input.

Pin No.
84
85
86
87
88
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90
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92
93
94
95
96
97
98
99
100

Signal Name	I/O	Function
ATRIX CONT 1	O	Audio matrix switching Stereo / Bilingual / Monaural MATRIX CONT 1: H / H / L MATRIX CONT 2: H / L / L
ATRIX CONT 2	O	
SEL	O	Input switching signal. "H" during line input.
NE STEREO	I	Stereo/monaural discrimination input of line input pin. "H" when plug is inserted in audio input pin (right).
ON	O	Speaker output ON/OFF signal. Speaker ON: "L".
C		Power supply pin.
G15	O	Not used.
G14	O	
G13	O	
G12	O	
G11	O	
G10	O	
G09	O	
G08	O	
S		GND pin.
G07	O	Not used.
G06	O	
G05	O	
G04	O	
G03	O	
G02	O	
G01	O	
G00	O	
3		
2		
1		
)		
M0	O	
M1	O	
M2	O	
M3	O	
CG	O	Character generator serial data communication chip select signal. V cycle "L" pulse.
COSMO	O	Serial data communication chip select signal to mechanism control micro processor. V cycle "L" pulse.
BUS	I	Serial data communication data input. V cycle "L" pulse row.
BUS	O	Serial data communication data output. V cycle "L" pulse row.
K	O	Clock for serial data communication.
		Not used.
WER ON	O	Power supply ON/OFF control signal. Power supply ON: "H".
ONITOR ON	O	External monitor power supply ON/OFF control signal. Power supply ON: "L".
VSS		GND pin.
EY AD IN 0	I	Key input signal. 0V: REC, 0.9V: STOP, 1.5V: FF, 2.2V: PB, 2.8V: SLOW, 5V: No input.
EY AD IN 1	I	Key input signal. 0V: PAUSE, 0.9V: REW, 1.5V: COUNTER RESET, 2.2V: DATA SCREEN, 5V: No input.

Pin No.	Signal Name	I/O	Function
84	KEY AD IN 2	I	Key input signal. 0V: VOLUME+, 0.9V: VOLUME–, 1.5V: BRIGHT +, 2.2V: BRIGHT –, 2.8V: MENU, 3.4V: ENTER, 5V: No input.
85	KEY AD IN 3	I	Not used.
86	EXT CTL	I	External pack control signal input.
87	ST/BI DET	I	Playback AFM STEREO/BILINGUAL detection input. 0V: Stereo, 2V: Monaural, 5V: Bilingual
88	P/N443/P60	I	Not used.
89	AUDIO SEL	I	
90	AVCC		Power supply pin.
91	EXT POWER ON	O	External pack power supply ON/OFF control signal. Power supply ON: "L".
92	E MODE	O	Normal/Hi8 switching signal. "H" when playing back a Hi8 tape recorded.
93	LINE AU BI/ST	I	Not used.
94	LCD ON/OFF	I	Liquid crystal display section open/close signal input. "H" when open.
95	LANC IN	I	LANC data input. V cycle "H" pulse row.
96	LANC OUT	O	LANC data output. V cycle "H" pulse row.
97			Not used.
98			Fixed at "H" level.
99	CL1		Sub-clock oscillation circuit. 32 kHz.
100	CL0		

3-10. INTERFACE

3-10-1. System Control – Video and Audio Block Interfaces (MA-137 Board)

Signal Name	I/O	Pin No.	VTR Mode												CAMERA Mode	
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB·PAUSE	SLOW	REC	REC PAUSE	STAND BY	REC
						CUE	REVIEW		CUE	REVIEW						
SP/$\overline{\text{LP}}$	O	IC101(91)	*1	H	H	*2	*2	*2	*2	*2	*1	*1	*14	H/L	H/L	*14
VA PB MODE	O	IC101(95)	L	L	L	H	H	H	H	H	H	H	L	L	L	L
JOG VD	O	IC101③	L	L	L	*5	*5	L	*5	*5	*5	*5	L	L	L	L
RP PB MODE	O	IC101①	H	H	H	H	H	H	H	H	H	H	L	H	H	L
$\overline{\text{FE ON}}$	O	IC101②	H	H	H	H	H	H	H	H	H	H	L	H	H	L
RF SWP	O	IC101(97)	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
JOG	O	IC101④	L	L	L	H	H	L	H	H	H	H	L	L	L	L
SP/$\overline{\text{LP}}$ DET	I	IC101(65)	L	*10	*10	*10	*10	L	*10	*10	*10		H	H	H	H
CLOG DET	I	IC101(82)	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	H	*11	*11	H
VTR SYNC	I	IC101(64)	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12
DOC MASK	O	IC101(92)	L	L	L	L	L	*13	L	L	L	L	L	L	L	L
VIDEO MUTE *15	O	IC101㊳	L	L	L	L	L	L	L	L	L	L	L	L	L	L
STILL·SLOW	O	IC101㉖	L	L	L	L	L	L	L	L	H	H	L	L	L	L
AUDIO MUTE	O	IC201㊴	L	L	L	H	H	L	H	H	H	H	L	L	L	L
LINE I/$\overline{\text{O}}$ SEL	O	IC201⑦	H	H	H	L	L	L	L	L	L	L	H	H	L	L
CS VIDEO	O	IC201㉞	V cycle "L" pulse													
$\overline{\text{D/A STB}}$	O	IC201㊲	V cycle "H" pulse													
SO BUS	O	IC201(76)	V cycle pulse row													
SCK	O	IC201(77)	V cycle "L" pulse row													

*1. Outputs the discrimination results of the mode just before. SP mode: "H", LP mode: "L".

*2. Outputs the discrimination results of the recording mode of the tape played back. SP mode: "H", LP mode: "L".

*5. False VD signal.

*7. 50% pulse of 30 Hz duty (synchronizes with drum rotation)

*10. "H" at SP recorded section of tape, "L" at LP recorded section.

*11. "H" at unrecorded section of tape or drop out section. Head clog detection input.

*12. Composite sync signal input separated from line input video signal, camera video signal or playback video signal. (Polarity +)

*13. 60 Hz pulse which is "H" for 1.3 msec. from the changing point of RF SWP.

*14. Changes by SP/LP switching. SP mode: "H", LP mode: "L".

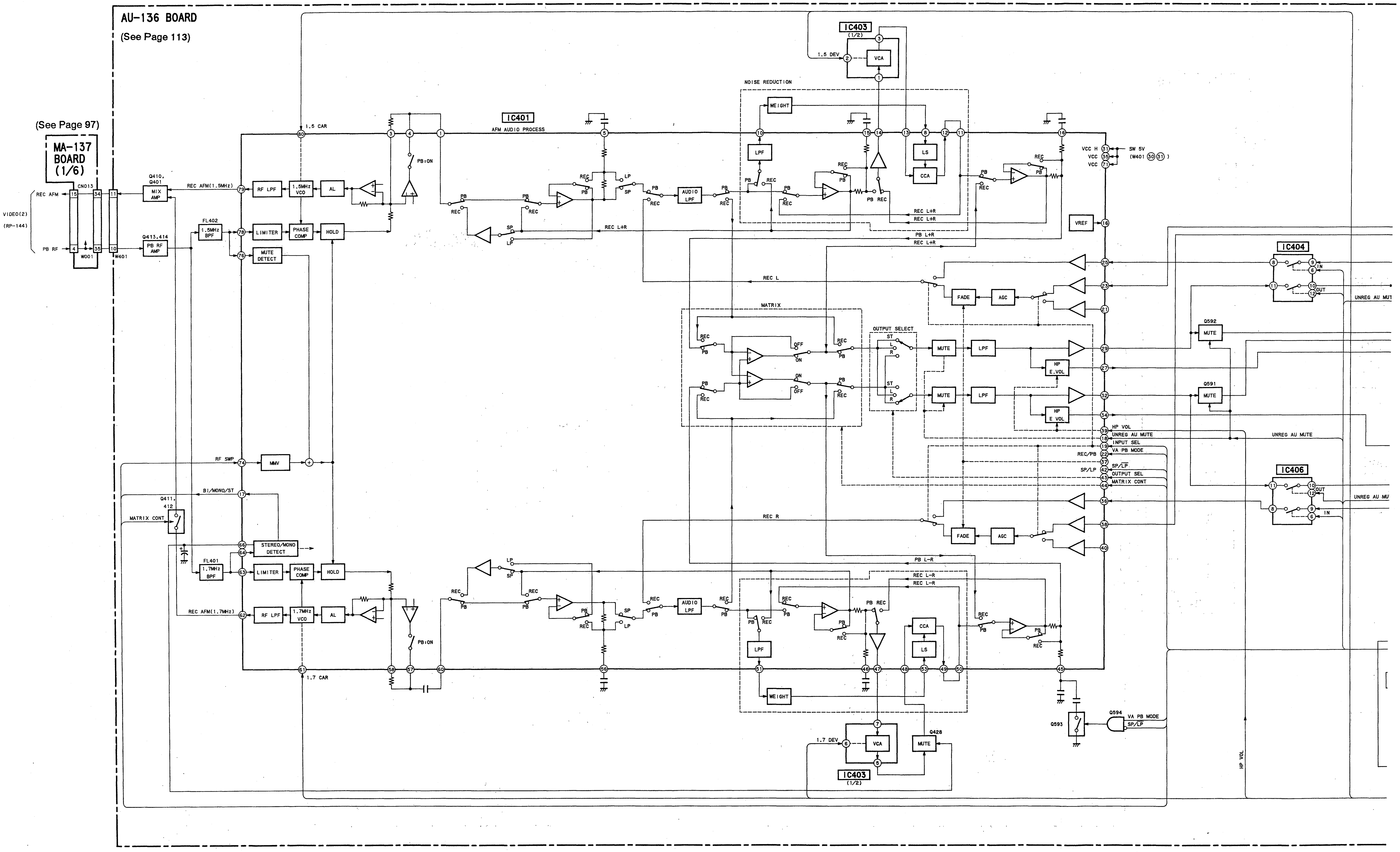
*15. "H" when the mode shifts from STOP to PB.

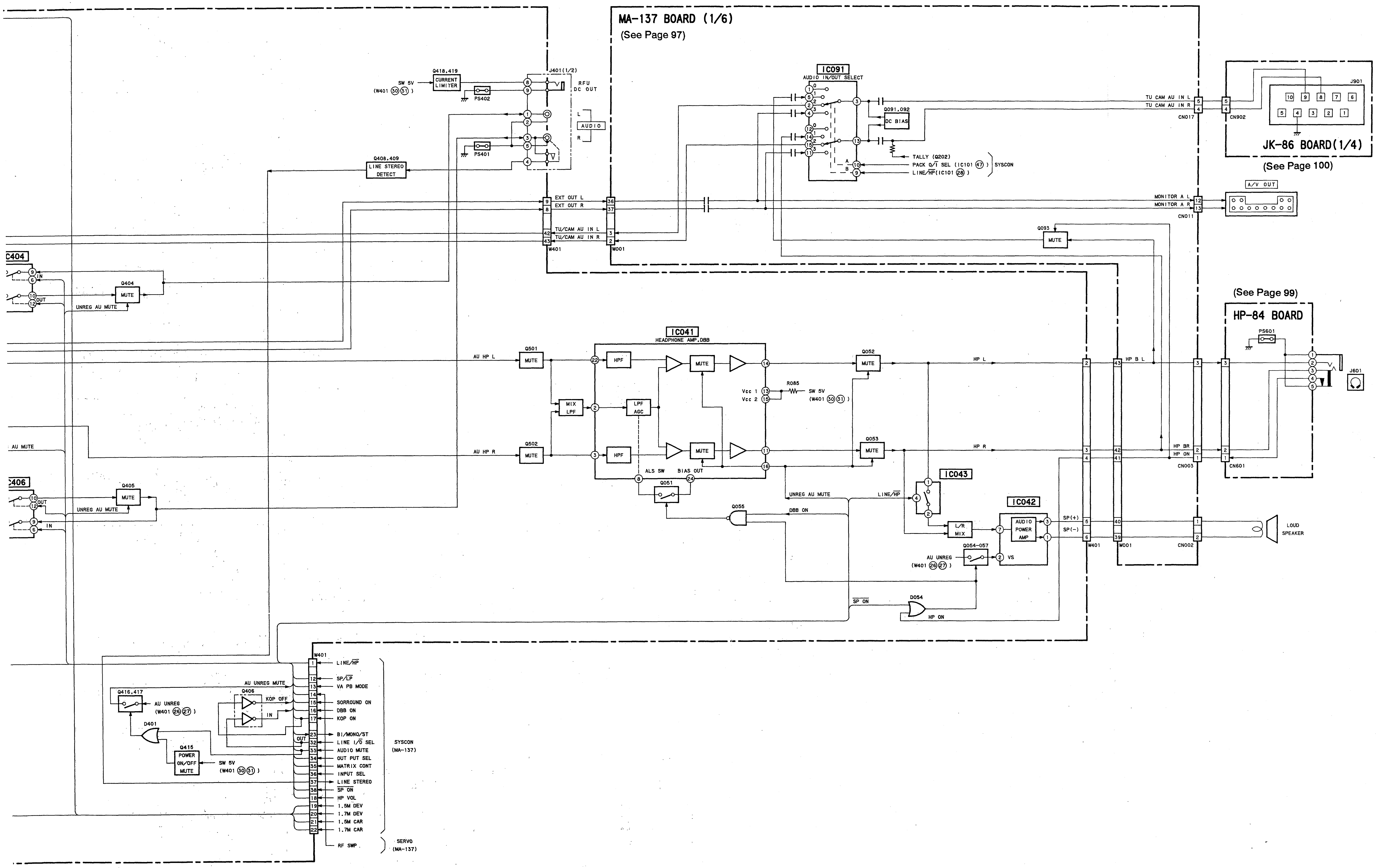
3-10-2. Mechanism Control – Servo Block Interface (MA-137 Board)

Signal Name	I/O	Pin No.	VTR Mode												CAMERA Mode	
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB·PAUSE	SLOW	REC	REC PAUSE	STAND BY	REC
						CUE	REVIEW		CUE	REVIEW						
T.REEL FG	I	IC101 (60)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1
S.REEL FG	I	IC101 (59)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1
ATF ERROR	I	IC101 (58)	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	IC101 (66)	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	IC101 (67)	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG/ CFG HMS	I	IC101 (68), (75)	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	IC101 (99)	L	H	H	H	H	H	H	H	L	*8	H	L	L	H
REF PILOT	O	IC101 (83)	*7	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RP PB MODE	O	IC101 ①	H	H	H	H	H	H	H	H	H	H	L	H	H	L
DRUM FWD/$\overline{\text{RVS}}$ *10	O	IC101 ㉝	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP FWD/$\overline{\text{RVS}}$	O	IC101 (100)	L	H	L	H	L	H	H	L	L	*8	H	L	L	H
DRUM PWM	O	IC101 (74)	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
CAP PWM	O	IC101 (73)	L	*9	*9	*9	*9	*9	*9	*9	L	*9	*9	L	L	*9
$\overline{\text{LM LIM CONT}}$ *11	O	IC101 ㉛	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON *12	O	IC101 (81)	L	H	H	H	H	H	H	H	H	H	H	H	H	H
DRUM ACC	O	IC101 (89)	L	L	L	L	L	L	L	L	L	*8	L	L	L	L
DRUM BRK	O	IC101 (90)	L	L	L	L	L	L	L	L	L	*8	L	L	L	L

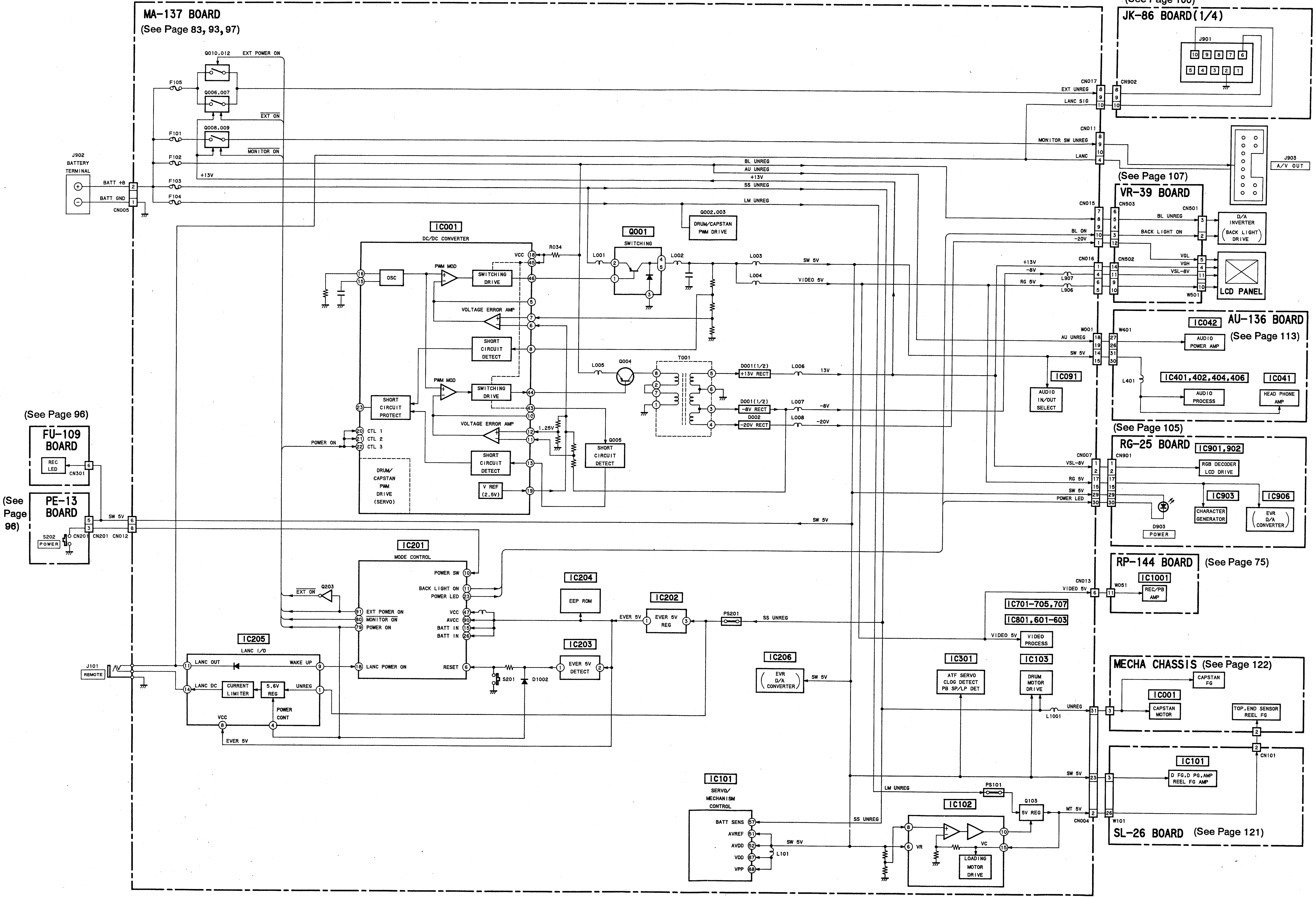
*1. A pulse whose amplitude has been modulated by the rotation of the reel is input. (200 msec. cycle during REC/PB).
*2. ATF error voltage input.
*3. One PG pulse is input with one drum rotation. Approx. 30 Hz.
*4. Six FG pulses are input with one drum rotation. Approx. 360 Hz.
*5. 520 FG pulses are input with one capstan rotation. Approx. 993 Hz during REC/PB (SP).
*6. Outputs four frequencies synchronized with the rotation of the drum. f_1=102.54 kHz, f_2=118.95 kHz, f_3=165.21 kHz, f_4=148.69 kHz.
*7. Outputs f_2 (118.95 kHz).
*8. "H" pulse when the tape is run.
*9. 21.5 μsec. cycle PWM signal.
*10. Normally "H". Temporarily "L" only during load/unload (drum reversal).
*11. Temporarily "H" only during cassette loading (To prevent your finger from being caught).
*12. H level is approx. 1.3 Vdc.

3-11. AUDIO BLOCK DIAGRAM

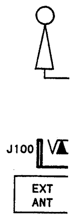

AU-136 BOARD
(See Page 113)
(See Page 97)
MA-137 BOARD (1/6)
CN013
W001
W401
VIDEO(2)
(RP-144)
REC AFM
PB RF
Q410, Q401
MIX AMP
Q413,414
PB RF AMP
REC AFM(1.5MHz)
FL402
1.5MHz BPF
RF LPF
1.5MHz VCO
AL
LIMITER
PHASE COMP
HOLD
MUTE DETECT
1.5 CAR
IC401
AFM AUDIO PROCESS
PB:ON
PB
REC
LP
SP
REC L+R
AUDIO LPF
NOISE REDUCTION
WEIGHT
LPF
LS
CCA
IC403
(1/2)
1.5 DEV
VCA
PB REC
REC L+R
PB L+R
VCC H
VCC
SW 5V
(W401 ㊿ (51))
VREF
REC L
FADE
AGC
IC404
IN
OUT
UNREG AU MUTE
MATRIX
OFF
ON
OUTPUT SELECT
ST
L
R
MUTE
HP E.VOL
Q592
Q591
HP VOL
INPUT SEL
VA PB MODE
REC/PB
SP/LP
OUTPUT SEL
MATRIX CONT
IC406
RF SWP
MMV
BI/MONO/ST
Q411, 412
MATRIX CONT
STEREO/MONO DETECT
FL401
1.7MHz BPF
REC AFM(1.7MHz)
1.7MHz VCO
1.7 CAR
REC R
PB L-R
REC L-R
1.7 DEV
Q428
Q593
Q594
VA PB MODE
SP/LP
HP VOL


MA-137 BOARD (1/6)
(See Page 97)
IC091
AUDIO IN/OUT SELECT
Q091,092
DC BIAS
TALLY (Q202)
PACK O/I SEL (IC101 (47))
LINE/HP(IC101 (28))
SYSCON
TU CAM AU IN L
TU CAM AU IN R
CN017
CN902
J901
JK-86 BOARD(1/4)
(See Page 100)
A/V OUT
MONITOR A L
MONITOR A R
CN011
Q093
MUTE
Q418,419
CURRENT LIMITER
SW 5V
(W401 (30)(31))
PS402
J401(1/2)
RFU DC OUT
AUDIO
L
R
PS401
Q408,409
LINE STEREO DETECT
EXT OUT L
EXT OUT R
TU/CAM AU IN L
TU/CAM AU IN R
W401
W001
IC404
IN
OUT
Q404
MUTE
UNREG AU MUTE
IC041
HEADPHONE AMP,DBB
AU HP L
AU HP R
Q501
Q502
MUTE
MIX LPF
HPF
LPF AGC
MUTE
ALS SW
BIAS OUT
Q051
Vcc 1
Vcc 2
R085
SW 5V
(W401 (30)(31))
Q052
Q053
HP L
HP R
(See Page 99)
HP-84 BOARD
PS601
J601
HP B L
HP BR
HP ON
CN003
CN601
AU MUTE
IC406
Q405
MUTE
UNREG AU MUTE
UNREG AU MUTE
DBB ON
Q055
LINE/HP
IC043
L/R MIX
IC042
AUDIO POWER AMP
SP(+)
SP(-)
VS
Q054-057
AU UNREG
(W401 (26)(27))
SP ON
D054
HP ON
CN002
LOUD SPEAKER
Q416,417
AU UNREG
(W401 (26)(27))
D401
Q415
POWER ON/OFF MUTE
SW 5V
(W401 (30)(31))
AU UNREG MUTE
Q406
KOP OFF
IN
OUT
LINE/HP
SP/LP
VA PB MODE
SORROUND ON
DBB ON
KOP ON
BI/MONO/ST
LINE I/O SEL
AUDIO MUTE
OUT PUT SEL
MATRIX CONT
INPUT SEL
LINE STEREO
SP ON
HP VOL
1.5M DEV
1.7M DEV
1.5M CAR
1.7M CAR
SYSCON
(MA-137)
RF SWP
SERVO
(MA-137)

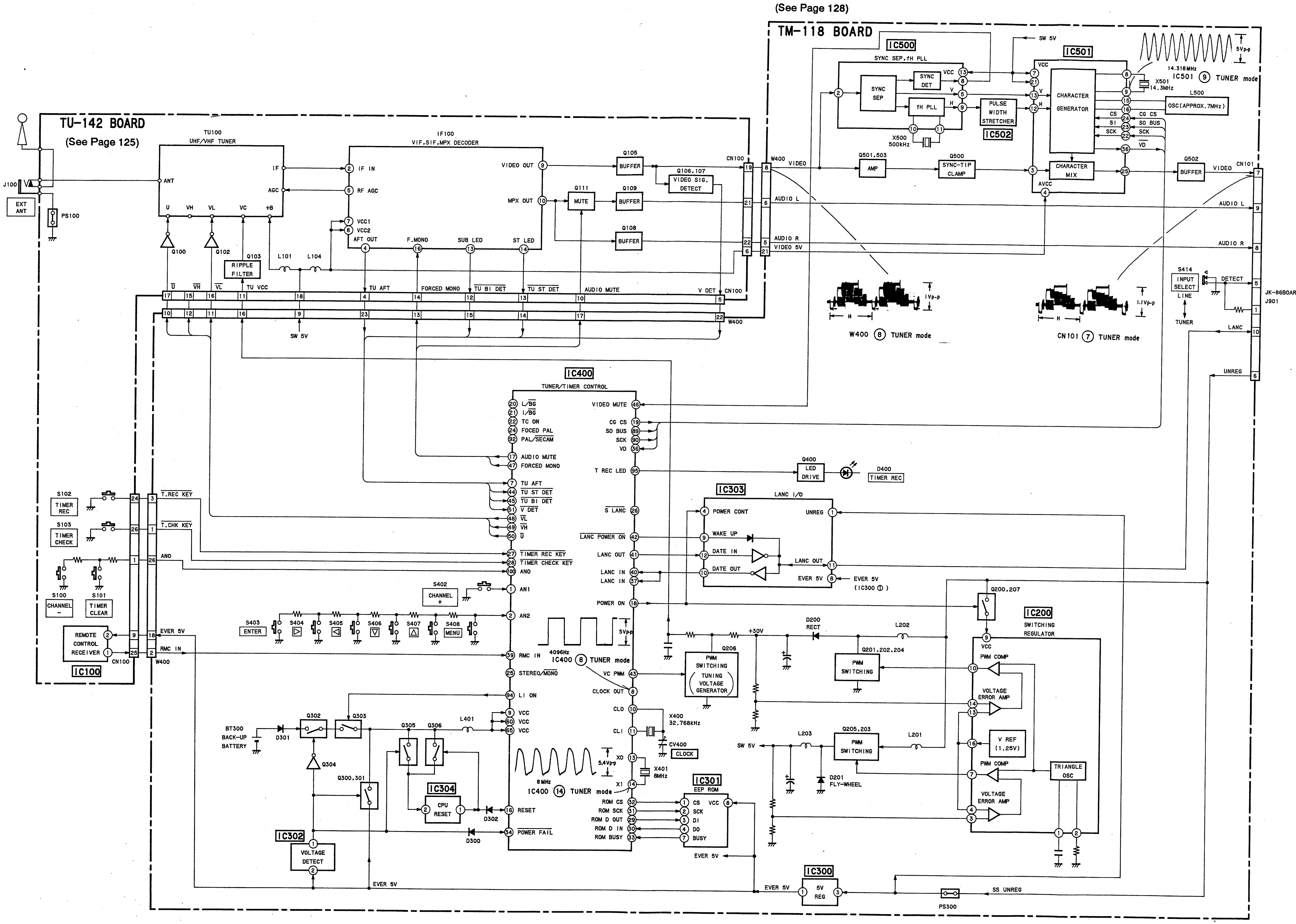
3-12 POWER BLOCK DIAGRAM


MA-137 BOARD
(See Page 83, 93, 97)
Q010,012
EXT POWER ON
F105
Q006,007
EXT ON
F101
Q008,009
MONITOR ON
F102
+13V
F103
F104
J902
BATTERY
TERMINAL
BATT +B
BATT GND
CN005
IC001
DC/DC CONVERTER
OSC
PWM MOD
SWITCHING DRIVE
VOLTAGE ERROR AMP
SHORT CIRCUIT DETECT
SHORT CIRCUIT PROTECT
POWER ON
CTL 1
CTL 2
CTL 3
DRUM/ CAPSTAN PWM DRIVE (SERVO)
V REF (2.5V)
VCC
R034
1.25V
Q001
SWITCHING
L001
L002
L003
L004
SW 5V
VIDEO 5V
Q002,003
DRUM/CAPSTAN PWM DRIVE
L005
Q004
T001
D001(1/2)
+13V RECT
D001(1/2)
-8V RECT
D002
-20V RECT
L006
L007
L008
13V
-8V
-20V
Q005
SHORT CIRCUIT DETECT
BL UNREG
AU UNREG
+13V
SS UNREG
LM UNREG
(See Page 96)
FU-109 BOARD
REC LED
CN301
(See Page 96)
PE-13 BOARD
S202
POWER
CN201
CN201
CN012
SW 5V
IC201
MODE CONTROL
POWER SW
BACK LIGHT ON
POWER LED
EXT POWER ON
MONITOR ON
POWER ON
VCC
AVCC
BATT IN
BATT IN
LANC POWER ON
RESET
EXT ON
Q203
IC204
EEP ROM
IC202
EVER 5V REG
EVER 5V
PS201
SS UNREG
IC203
EVER 5V DETECT
S201
D1002
IC205
LANC I/O
LANC OUT
WAKE UP
LANC DC
CURRENT LIMITER
5.6V REG
UNREG
POWER CONT
VCC
EVER 5V
J101
REMOTE
IC206
EVR D/A CONVERTER
SW 5V
IC101
SERVO/ MECHANISM CONTROL
BATT SENS
AVREF
AVDD
VDD
VPP
L101
SW 5V
SS UNREG
LM UNREG
PS101
Q103
5V REG
MT 5V
IC102
VR
VC
LOADING MOTOR DRIVE
IC301
ATF SERVO CLOG DETECT PB SP/LP DET
IC103
DRUM MOTOR DRIVE
L1001
UNREG
CN004
IC701-705,707
IC801,601-603
VIDEO 5V
VIDEO PROCESS
IC091
AUDIO IN/OUT SELECT
CN017
EXT UNREG
LANC SIG
CN011
MONITOR SW UNREG
LANC
CN015
BL ON
-20V
CN016
+13V
-8V
RG 5V
L907
L906
W001
AU UNREG
SW 5V
CN007
VSL-8V
RG 5V
SW 5V
POWER LED
CN013
VIDEO 5V
(See Page 100)
JK-86 BOARD(1/4)
J901
CN902
J903
A/V OUT
(See Page 107)
VR-39 BOARD
CN503
CN501
BL UNREG
BACK LIGHT ON
D/A INVERTER (BACK LIGHT DRIVE)
CN502
VGL
VGH
VSL-8V
W501
LCD PANEL
IC042
AU-136 BOARD
(See Page 113)
W401
AUDIO POWER AMP
L401
IC401,402,404,406
AUDIO PROCESS
IC041
HEAD PHONE AMP
(See Page 105)
RG-25 BOARD
IC901,902
CN901
RGB DECODER LCD DRIVE
IC903
CHARACTER GENERATOR
IC906
EVR D/A CONVERTER
D903
POWER
RP-144 BOARD
(See Page 75)
W051
IC1001
REC/PB AMP
MECHA CHASSIS (See Page 122)
CAPSTAN FG
IC001
CAPSTAN MOTOR
TOP,END SENSOR REEL FG
CN101
IC101
D FG,D PG,AMP REEL FG AMP
W101
SL-26 BOARD
(See Page 121)

3-13. TU


J100
EXT ANT

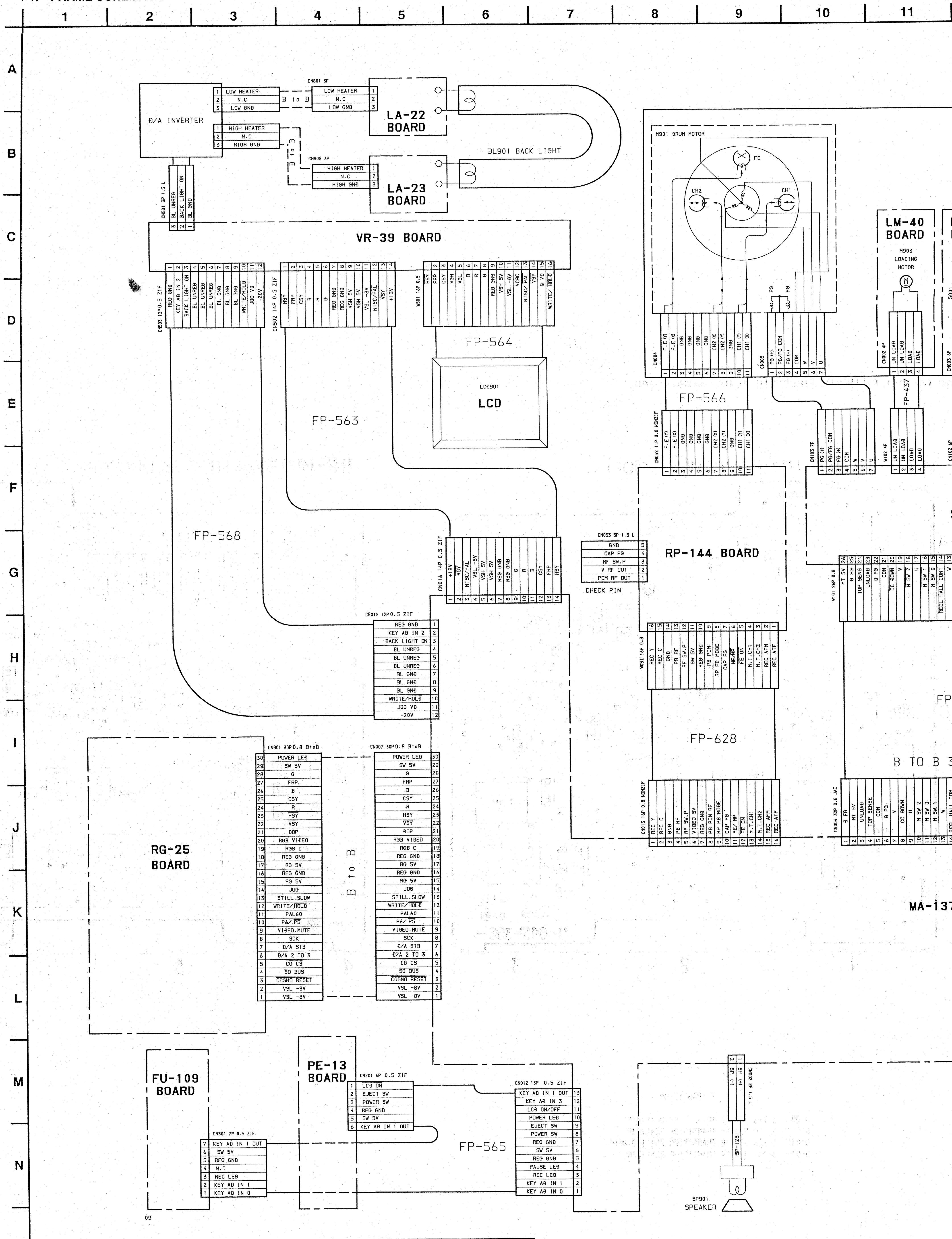
3-13. TUNER/TIMER BLOCK DIAGRAM



(See Page 128)
TM-118 BOARD
TU-142 BOARD
(See Page 125)
J100
EXT ANT
PS100
TU100
UHF/VHF TUNER
ANT
IF
AGC
U
VH
VL
VC
+B
IF100
VIF,SIF,MPX DECODER
IF IN
RF AGC
VCC1
VCC2
AFT OUT
F.MONO
SUB LED
ST LED
VIDEO OUT
MPX OUT
Q100
Q102
Q103
RIPPLE FILTER
L101
L104
Q105
BUFFER
Q106,107
VIDEO SIG. DETECT
Q111
MUTE
Q109
BUFFER
Q108
BUFFER
CN100
W400
TU VCC
TU AFT
FORCED MONO
TU BI DET
TU ST DET
AUDIO MUTE
V DET
SW 5V
IC500
SYNC SEP,fH PLL
SYNC SEP
SYNC DET
fH PLL
VCC
X500
500kHz
PULSE WIDTH STRETCHER
IC502
IC501
CHARACTER GENERATOR
CHARACTER MIX
AVCC
CS
SI
SCK
CG CS
SO BUS
VD
14.318MHz
X501
14.3MHz
IC501 ⑨ TUNER mode
5Vp-p
L500
OSC(APPROX.7MHz)
Q501,503
AMP
Q500
SYNC-TIP CLAMP
Q502
BUFFER
VIDEO
AUDIO L
AUDIO R
VIDEO 5V
CN101
1Vp-p
H
W400 ⑧ TUNER mode
1.1Vp-p
CN101 ⑦ TUNER mode
S414
INPUT SELECT
LINE
TUNER
DETECT
LANC
UNREG
JK-86BOARD
J901
IC400
TUNER/TIMER CONTROL
L/BG
I/BG
TC ON
FOCED PAL
PAL/SECAM
AUDIO MUTE
FORCED MONO
TU AFT
TU ST DET
TU BI DET
V DET
VL
VH
U
TIMER REC KEY
TIMER CHECK KEY
ANO
AN1
AN2
RMC IN
STEREO/MONO
LI ON
VCC
RESET
POWER FAIL
VIDEO MUTE
CG CS
SO BUS
SCK
VD
T REC LED
S LANC
LANC POWER ON
LANC OUT
LANC IN
POWER ON
VC PWM
CLOCK OUT
CLO
CLI
XO
XI
ROM CS
ROM SCK
ROM D OUT
ROM D IN
ROM BUSY
Q400
LED DRIVE
D400
TIMER REC
IC303
LANC I/O
POWER CONT
WAKE UP
DATE IN
DATE OUT
UNREG
LANC OUT
EVER 5V
EVER 5V (IC300 ①)
S102
TIMER REC
S103
TIMER CHECK
T.REC KEY
T.CHK KEY
S100
CHANNEL -
S101
TIMER CLEAR
REMOTE CONTROL RECEIVER
IC100
RMC IN
EVER 5V
S402
CHANNEL +
S403
ENTER
S404
S405
S406
S407
S408
MENU
5Vp-p
4096Hz
IC400 ⑧ TUNER mode
5.4Vp-p
8MHz
IC400 ⑭ TUNER mode
X400
32.768kHz
CV400
CLOCK
X401
8MHz
IC301
EEP ROM
CS
SCK
DI
DO
BUSY
VCC
BT300
BACK-UP BATTERY
D301
Q302
Q303
Q304
Q305
Q306
L401
Q300,301
IC304
CPU RESET
D302
D300
IC302
VOLTAGE DETECT
EVER 5V
Q206
PWM SWITCHING
TUNING VOLTAGE GENERATOR
+30V
D200
RECT
L202
Q201,202,204
PWM SWITCHING
Q200,207
IC200
SWITCHING REGULATOR
VCC
PWM COMP
VOLTAGE ERROR AMP
V REF (1.25V)
TRIANGLE OSC
SW 5V
L203
Q205,203
PWM SWITCHING
L201
D201
FLY-WHEEL
IC300
5V REG
PS300
SS UNREG

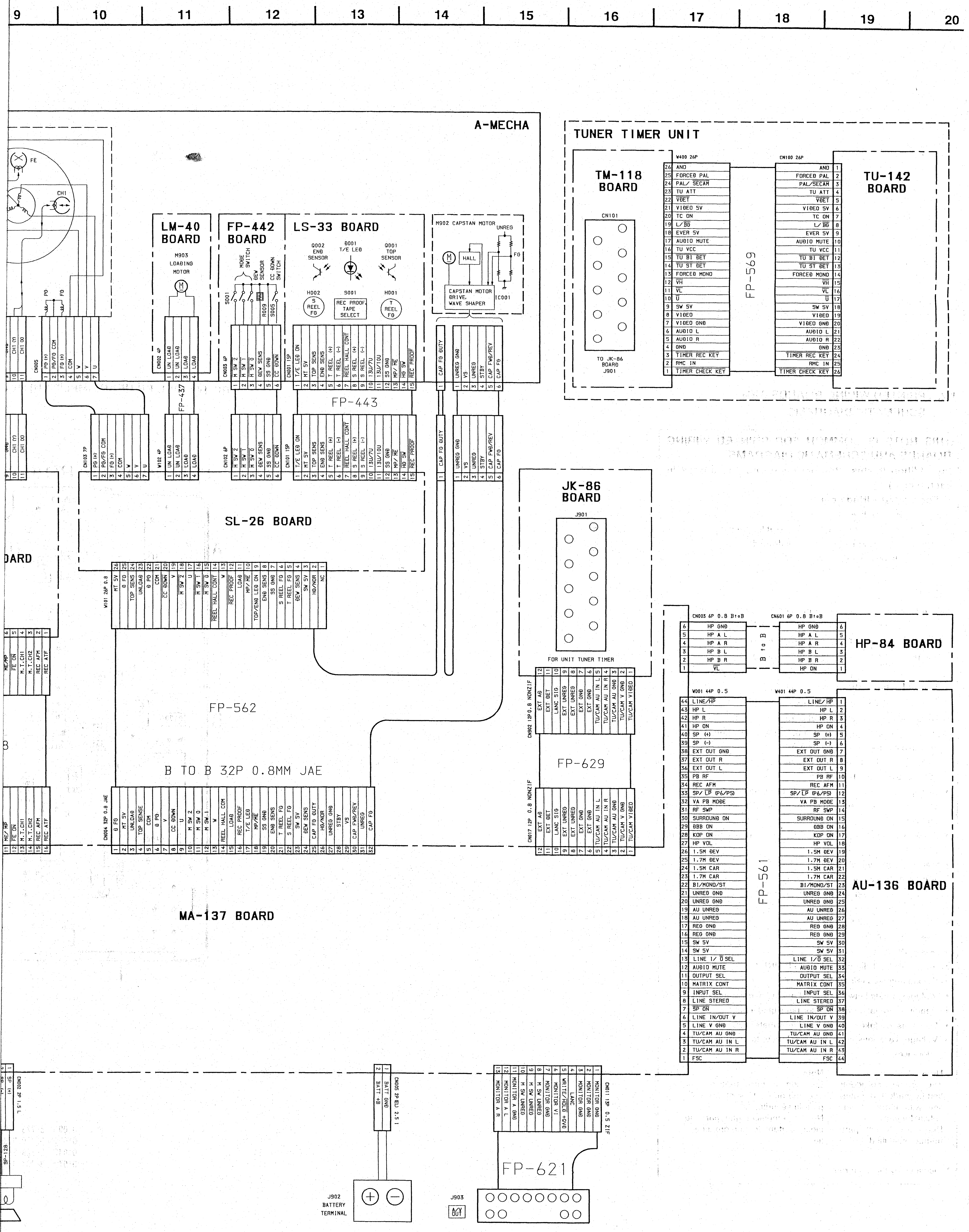
SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



Ð/A INVERTER
LOW HEATER
N.C
LOW GNÐ
HIGH HEATER
HIGH GNÐ
B to B
CN801 3P
CN802 3P
LA-22 BOARD
LA-23 BOARD
BL901 BACK LIGHT
CN501 3P 1.5 L
BL UNREG
BACK LIGHT ON
BL GNÐ
VR-39 BOARD
CN503 12P 0.5 ZIF
CN502 14P 0.5 ZIF
W501 16P 0.5
FP-564
LCD901
LCD
FP-563
FP-568
CN016 14P 0.5 ZIF
CN015 12P 0.5 ZIF
REG GNÐ
KEY AÐ IN 2
BL UNREG
BL GNÐ
WRITE/HOLÐ
JOG VÐ
-20V
+13V
VSY
NTSC/PAL
VSL -8V
VSH 5V
G
R
B
CSY
FRP
HSY
VGH
VGL
VCBC
Q VÐ
CN053 5P 1.5 L
GNÐ
CAP FG
RF SW.P
V RF OUT
PCM RF OUT
CHECK PIN
RP-144 BOARD
W051 16P 0.8
CN013 16P 0.8 NONZIF
REC Y
REC C
PB RF
VIDEO 5V
PB PCM RF
RP PB MODE
ME/MP
FE ON
M.T.CH1
M.T.CH2
REC AFM
REC ATF
FP-628
M901 DRUM MOTOR
FE
CH1
CH2
PG
FG
CN004
F.E (Y)
F.E (X)
CH2 (X)
CH2 (Y)
CH1 (Y)
CH1 (X)
CN005
PG (+)
PG/FG COM
FG (+)
COM
W
V
U
FP-566
CN052 11P 0.8 NONZIF
CN103 7P
LM-40 BOARD
M903 LOADING MOTOR
CN002 4P
UN LOAD
LOAD
FP-437
W102 4P
W101 26P 0.8
CN004 32P 0.8 JAE
MT 5V
Ð FG
TOP SENSE
UNLOAÐ
Ð PG
CC ÐOWN
M SW 2
M SW 1
M SW 0
REEL HALL CONT
B TO B
MA-137
CN901 30P 0.8 BtoB
CN007 30P 0.8 BtoB
POWER LEÐ
SW 5V
ÐOP
RGB VIDEO
RGB C
RG 5V
JOG
STILL.SLOW
PAL60
P6/P5
VIDEO.MUTE
SCK
Ð/A STB
Ð/A 2 TO 3
CG CS
SO BUS
COSMO RESET
RG-25 BOARD
FU-109 BOARD
CN301 7P 0.5 ZIF
KEY AÐ IN 1 OUT
N.C
REC LEÐ
KEY AÐ IN 1
KEY AÐ IN 0
PE-13 BOARD
CN201 6P 0.5 ZIF
LCD ON
EJECT SW
POWER SW
CN012 13P 0.5 ZIF
KEY AÐ IN 3
LCD ON/OFF
PAUSE LEÐ
FP-565
CN002 2P 1.5 L
SP (-)
SP (+)
SP-128
SP901 SPEAKER
09

FRAME FRAME


9
10
11
12
13
14
15
16
17
18
19
20
A-MECHA
FE
CH1
PG
FG
CN005
LM-40 BOARD
M903 LOADING MOTOR
CN002 4P
FP-442 BOARD
S001
MODE SWITCH
DEW SENSOR
CC DOWN SWITCH
R009
S005
CN003 6P
LS-33 BOARD
Q002 END SENSOR
D001 T/E LED
Q001 TOP SENSOR
H002 S REEL FG
S001 REC PROOF TAPE SELECT
H001 T REEL FG
CN001 15P
M902 CAPSTAN MOTOR
UNREG
HALL
CAPSTAN MOTOR DRIVE, WAVE SHAPER
IC001
FP-437
FP-443
CN103 7P
W102 4P
CN102 6P
CN101 15P
SL-26 BOARD
W101 26P 0.8
FP-562
B TO B 32P 0.8MM JAE
CN004 32P 0.8 JAE
MA-137 BOARD
JK-86 BOARD
J901
FOR UNIT TUNER TIMER
CN902 12P 0.8 NONZIF
FP-629
CN017 12P 0.8 NONZIF
TUNER TIMER UNIT
TM-118 BOARD
CN101
TO JK-86 BOARD J901
W400 26P
FP-569
CN100 26P
TU-142 BOARD
CN003 6P 0.8 BtoB
B to B
CN601 6P 0.8 BtoB
HP-84 BOARD
W001 44P 0.5
FP-561
W401 44P 0.5
AU-136 BOARD
CN002 2P 1.5 L
SP-128
CN005 2P ELI 2.5 1
BATT GND
BATT +B
J902 BATTERY TERMINAL
CN011 13P 0.5 ZIF
FP-621
J903

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○ : Through hole
- ▨ : Pattern from the side which enables seeing.
  (The other layer's patterns are not indicated.)
- Circled numbers refer to waveforms.

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

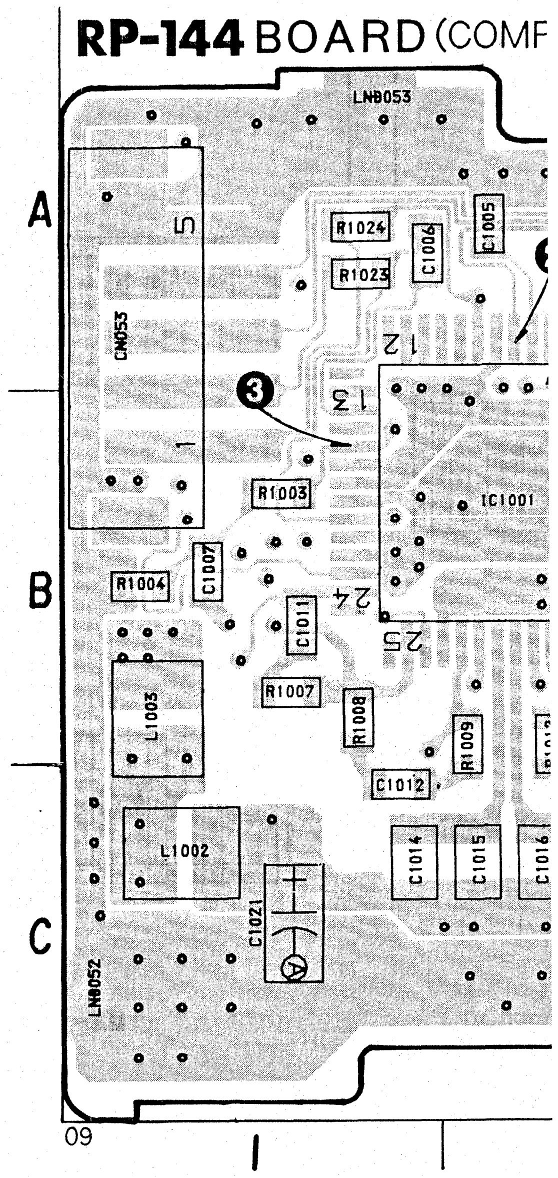
- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repeair.*
- ── : B+ Line.*
- - - - : B– Line.*
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*
- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

*: indicated by the color red.

RP-144 (REC/PB HEAD AMPLIFIER) PRINTE

RP-144 BOARD (COMF



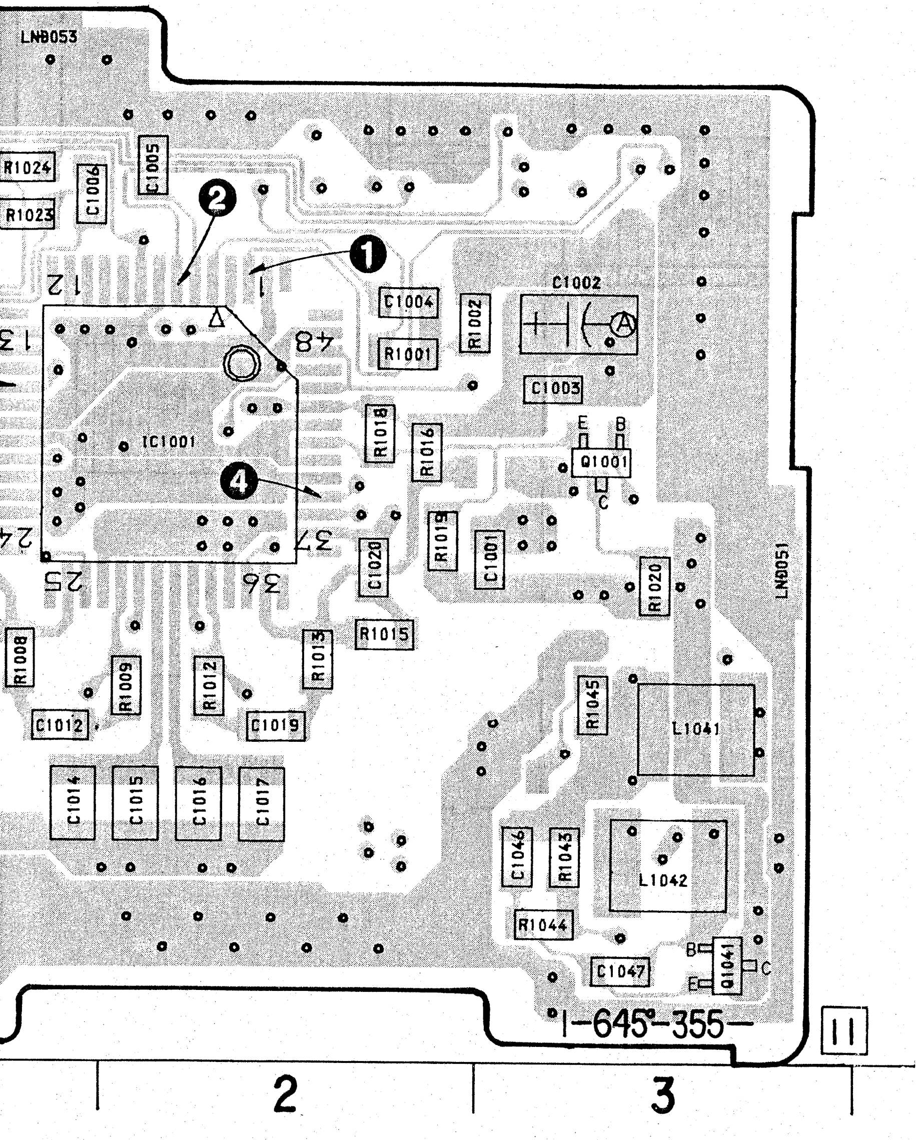
RP-144 BOARD

IC1001	B-2
Q1001	B-3
Q1041	C-3
Q1042	C-4
Q1043	B-5

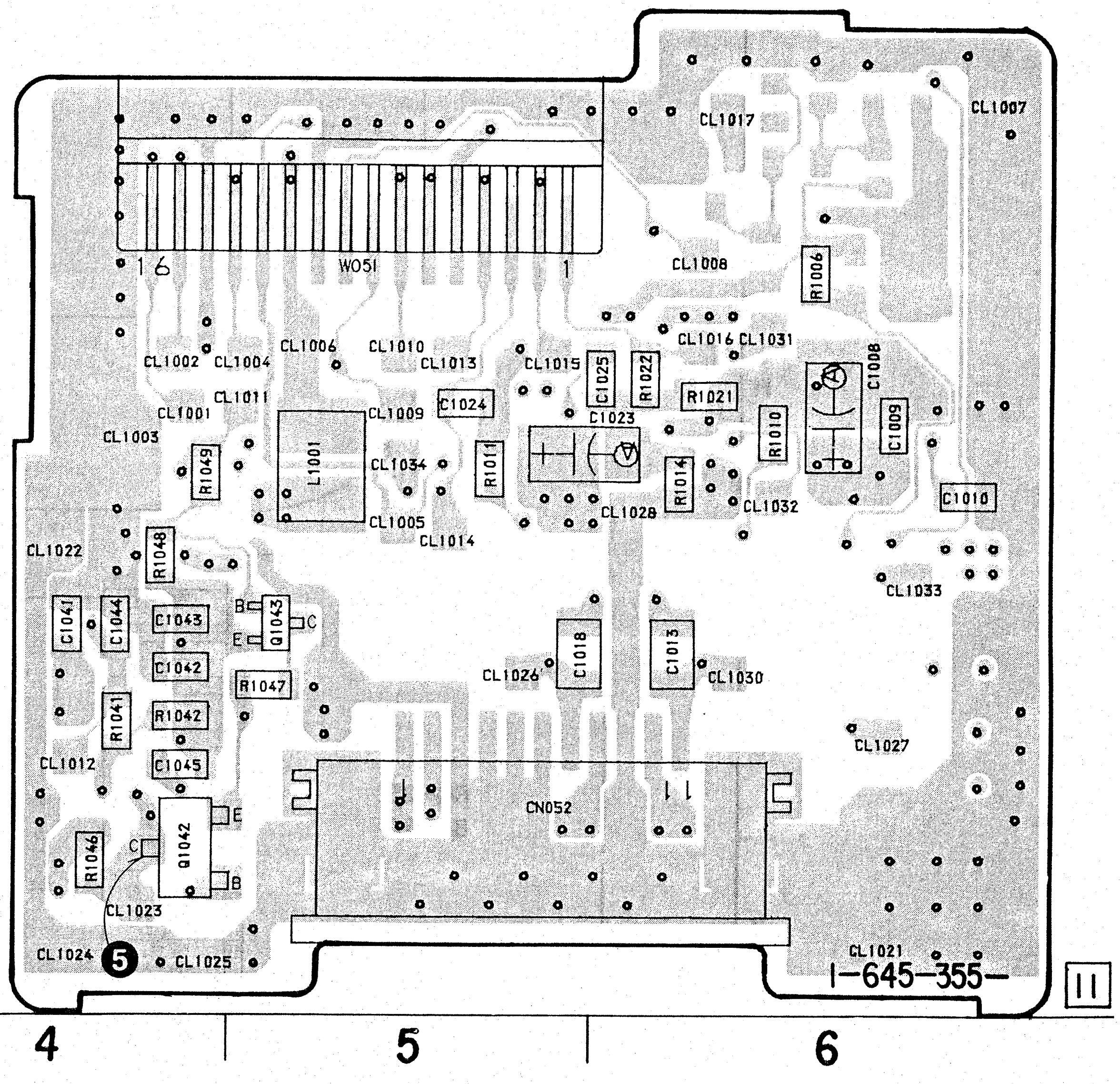
IC1001	8-752-033-38
Q1001	8-729-928-27
Q1041	8-729-928-19
Q1042	8-729-820-76
Q1043	8-729-928-19

MPLIFIER) PRINTED WIRING BOARD

ARD (COMPONENT SIDE)


LN0053
R1024
R1023
C1006
C1005
C1004
R1001
R1002
C1002
C1003
IC1001
Q1001
E
B
C
R1018
R1016
R1019
C1001
C1020
R1015
R1013
R1008
R1009
R1012
C1012
C1019
C1014
C1015
C1016
C1017
R1020
LN0051
R1045
L1041
C1046
R1043
L1042
R1044
C1047
Q1041
1-645-355-
11
12
13
1
48
24
25
36
37
2
3

RP-144 BOARD (CONDUCTOR SIDE)


CL1007
CL1017
CL1008
R1006
W051
16
1
CL1002
CL1004
CL1006
CL1010
CL1013
CL1015
CL1016
CL1031
CL1011
CL1001
CL1003
CL1009
C1024
C1025
R1022
R1021
R1010
C1008
C1009
C1023
R1049
L1001
CL1034
R1011
R1014
CL1028
CL1032
C1010
CL1005
CL1014
CL1022
R1048
CL1033
C1041
C1044
C1043
Q1043
C1042
R1047
CL1026
C1018
C1013
CL1030
R1041
R1042
CL1027
CL1012
C1045
CN052
R1046
Q1042
CL1023
CL1024
CL1025
CL1021
1-645-355-
11
4
5
6

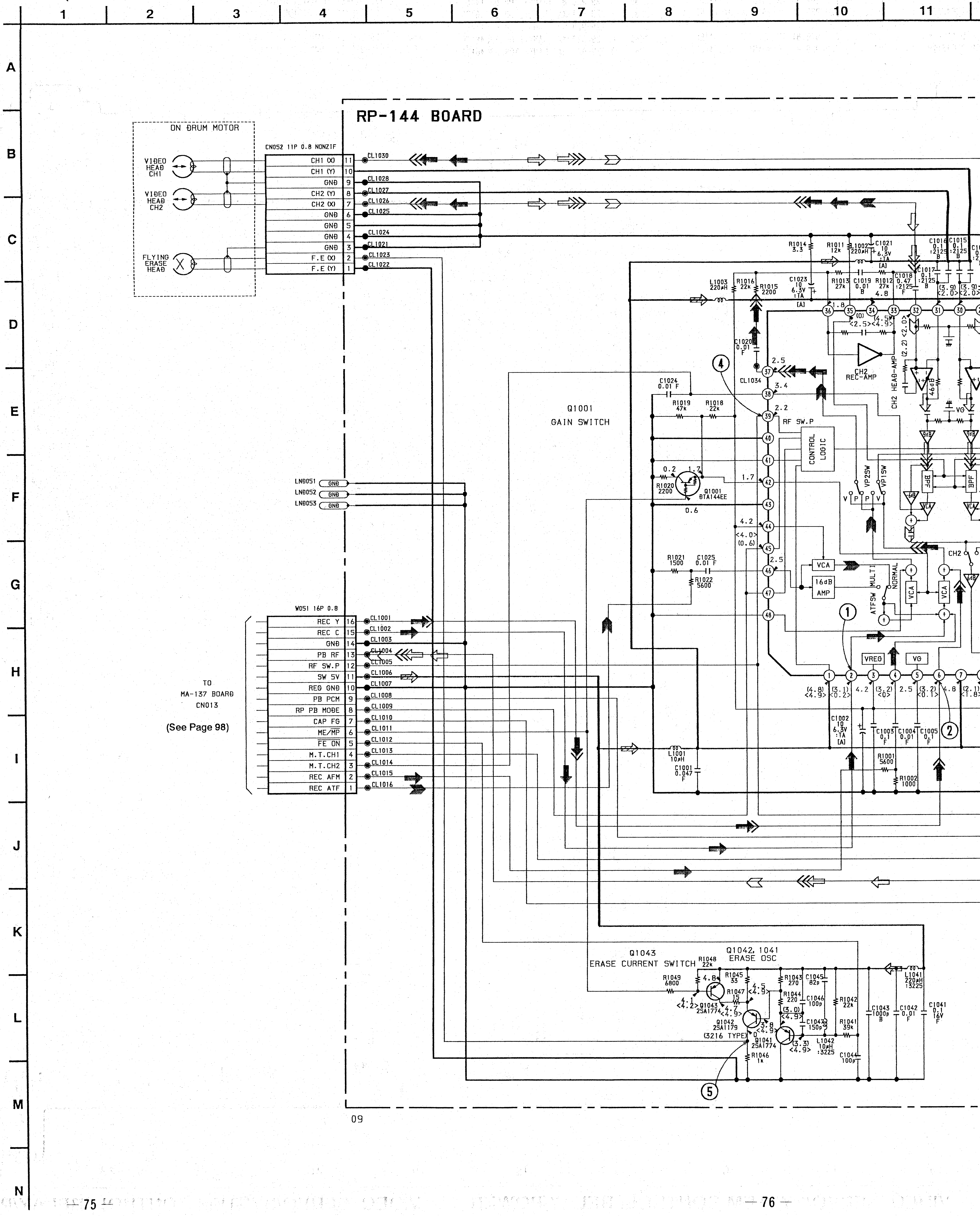
(IC)

IC1001	8-752-033-38	IC	CXA1202R

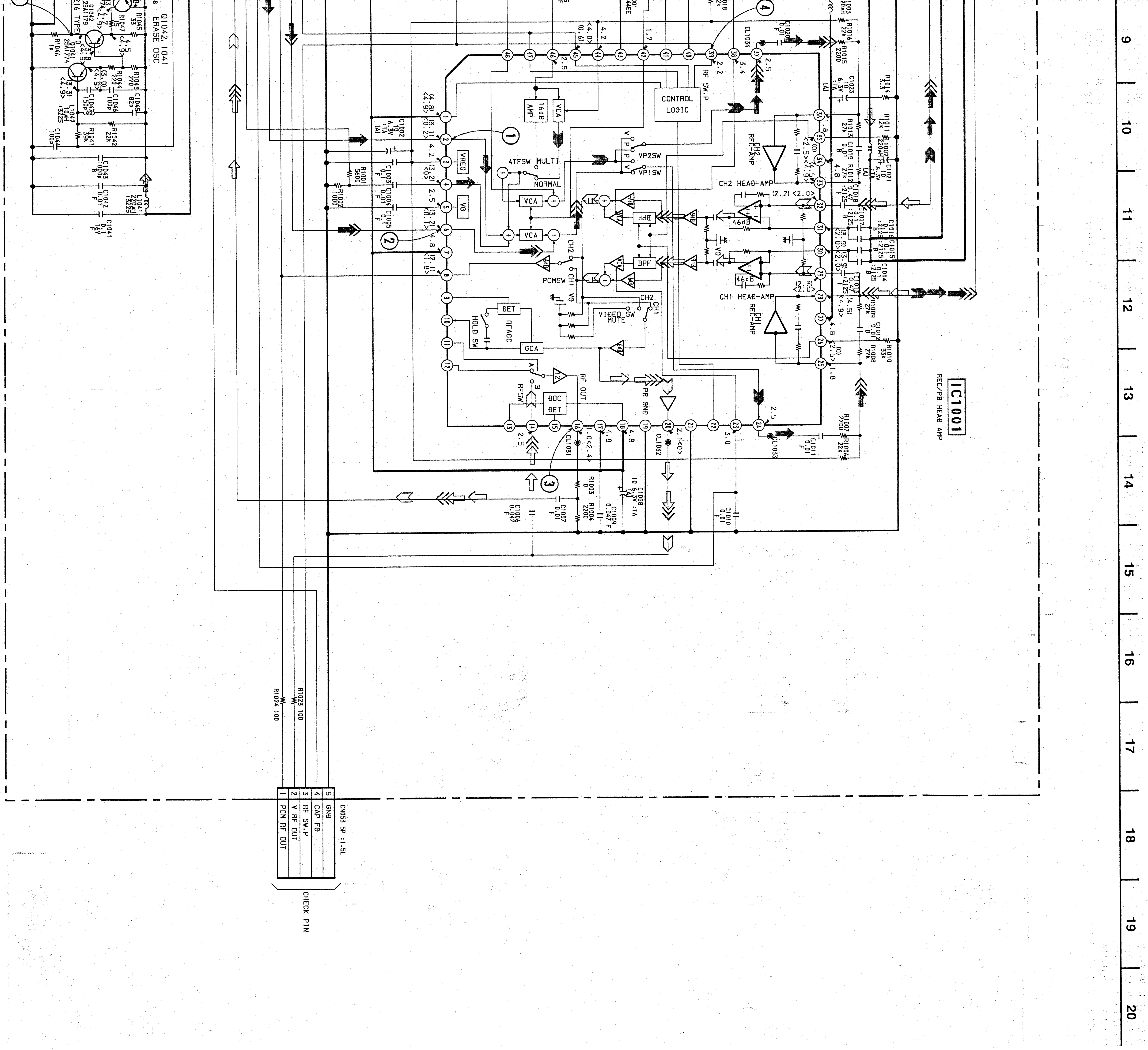
(TRANSISTOR)

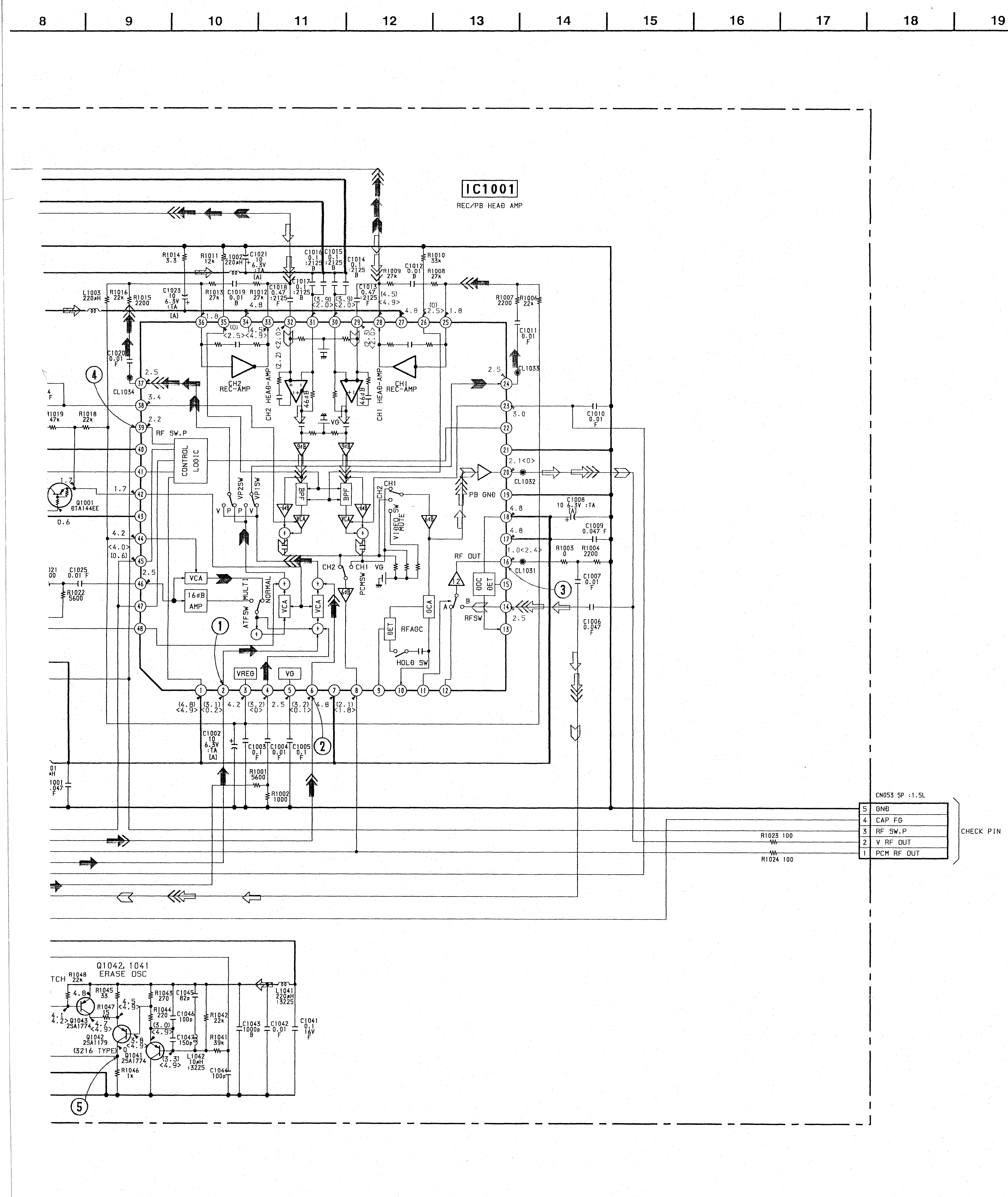
Q1001	8-729-928-27	TRANSISTOR	DTA144EE
Q1041	8-729-928-19	TRANSISTOR	2SA1774R
Q1042	8-729-820-76	TRANSISTOR	2SA1179-M5M6
Q1043	8-729-928-19	TRANSISTOR	2SA1774R

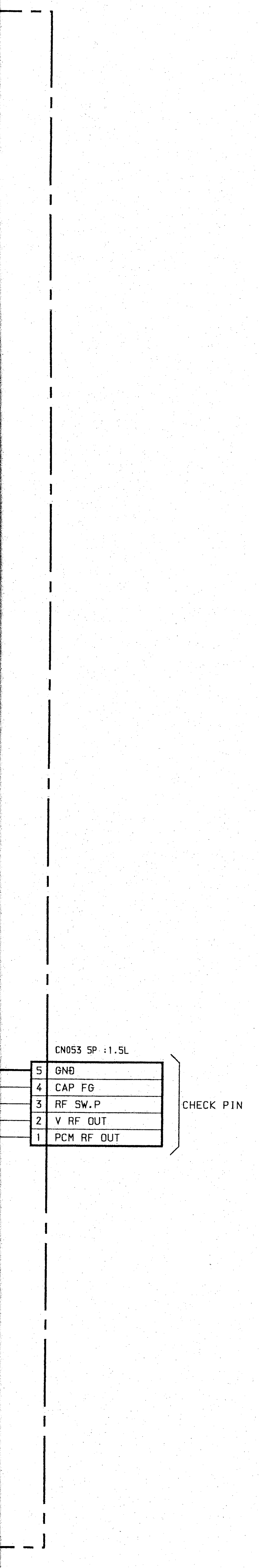
RP-144 (REC/PB HEAD AMPLIFIER) SCHEMATIC DIAGRAM



RP-144 BOARD
ON DRUM MOTOR
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE HEAD
CN052 11P 0.8 NONZIF
CH1 (X)
CH1 (Y)
GND
CH2 (Y)
CH2 (X)
F.E (X)
F.E (Y)
LN0051 GND
LN0052 GND
LN0053 GND
W051 16P 0.8
REC Y
REC C
PB RF
RF SW.P
SW 5V
REG GND
PB PCM
RP PB MODE
CAP FG
ME/MP
FE ON
M.T.CH1
M.T.CH2
REC AFM
REC ATF
TO MA-137 BOARD CN013
(See Page 98)
Q1001 GAIN SWITCH
Q1001 BTA144EE
CONTROL LOGIC
CH2 REC-AMP
CH2 HEAD-AMP
RF SW.P
VP2SW
VP1SW
ATFSW
MULTI
NORMAL
VCA
16dB AMP
VREG
VG
BPF
46dB
Q1043 ERASE CURRENT SWITCH
Q1042, 1041 ERASE OSC
Q1043 2SA1774
Q1042 2SA1179 (3216 TYPE)
Q1041 2SA1774
09


IC1001
REC/PB HEAD AMP
CONTROL LOGIC
16dB AMP
VCA
VREG
VG
ATFSW
MULTI
NORMAL
VP2SW
VP1SW
CH2 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
CH1 REC-AMP
BPF
46dB
PCMSW
CH1
CH2
VIDEO SW
MUTE
DET
RFAGC
HOLD SW
GCA
DOC DET
RF OUT
RFSW
PB GND
RF SW.P
Q1042, 1041 ERASE OSC
R1001 5600
R1002 1000
R1023 100
R1024 100
CN053 5P :1.5L
1 PCM RF OUT
2 V RF OUT
3 RF SW.P
4 CAP FG
5 GND
CHECK PIN
①
②
③
④
9
10
11
12
13
14
15
16
17
18
19
20


8
9
10
11
12
13
14
15
16
17
18
19
IC1001
REC/PB HEAD AMP
CONTROL LOGIC
RF SW.P
VP2SW
VP1SW
CH2 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
CH1 REC-AMP
BPF
VCA
16dB AMP
ATFSW
MULTI
NORMAL
VREG
VG
PCMSW
VIDEO SW MUTE
GCA
DET
RFAGC
HOLD SW
DOC DET
RF OUT
RFSW
PB GND
CL1031
CL1032
CL1033
CL1034
Q1001 DTA144EE
Q1042, 1041
ERASE OSC
Q1043 2SA1774
Q1042 2SA1179 (3216 TYPE)
Q1041 2SA1774
CN053 5P :1.5L
5 GND
4 CAP FG
3 RF SW.P
2 V RF OUT
1 PCM RF OUT
CHECK PIN
R1023 100
R1024 100

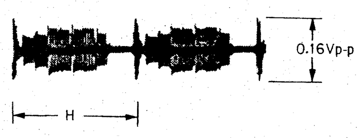

CN053 5P :1.5L
5 GND
4 CAP FG
3 RF SW.P
2 V RF OUT
1 PCM RF OUT
CHECK PIN

- **SIGNAL PATH**

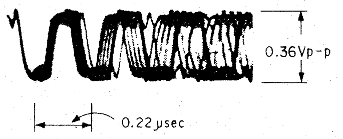
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB			⇨»»	⇨

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal	➤		▷

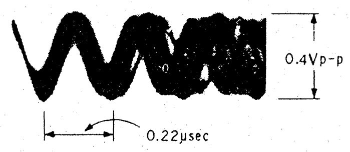
RP-144 BOARD

①


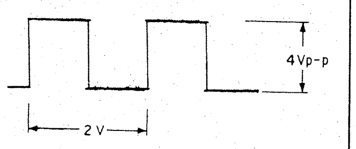
IC1001 ② REC

②


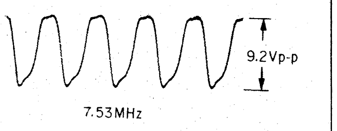
IC1001 ⑥ REC

③


IC1001 ⑯ PB

④


IC1001 (39) REC/PB

⑤


Q1042 ⓒ REC

MA-137 (VIDEO, SERVO/SYSTEM CONTROL, RELAY/POWER) PRINTED WIRING BOARD

MA-137 BOARD

D001	B-22
D002	B-22
D004	H-19
D101	H-3
D199	I-15
D301	E-1
D310	H-22
D601	I-15
D602	H-8
D603	G-7
D701	D-16
D1000	H-1
D1001	G-18
D1002	C-6
IC001	C-21
IC091	[illegible]-1
IC101	F-21
IC102	I-4
IC103	I-21
IC201	C-19
IC202	C-6
IC203	C-5
IC204	B-6
IC205	D-6
IC206	B-5
IC301	F-2
IC601	H-15
IC602	I-16
IC603	I-17
IC701	F-10
IC702	F-13
IC703	F-15
IC704	C-8
IC705	E-16
IC707	F-15
IC801	C-14
Q001	B-21
Q002	D-22
Q003	D-21
Q004	C-23
Q005	C-3
Q006	I-6
Q007	H-7
Q008	I-7
Q009	H-6
Q010	I-18
Q012	H-19
Q091	I-23
Q092	I-23
Q093	F-1
Q101	G-2
Q103	I-5
Q202	B-20
Q203	E-5
Q310	I-23
Q311	I-22
Q312	J-21
Q313	H-3
Q609	H-13
Q611	H-13
Q619	H-10
Q621	H-15
Q622	H-14
Q623	H-15
Q625	H-14
Q626	I-10
Q627	I-8
Q628	I-8
Q629	H-9
Q630	I-10
Q631	H-9
Q632	H-10
Q633	H-8
Q634	H-10
Q701	G-13
Q702	G-14
Q703	F-14
Q705	F-8
Q706	G-14
Q707	G-13
Q708	F-8
Q712	B-8
Q713	B-8
Q714	B-8
Q717	G-11
Q719	E-14
Q720	F-14
Q721	E-15
Q722	E-9
Q723	D-16
Q724	E-8
Q730	G-15
Q732	E-15
Q755	G-15
Q760	F-8
Q761	F-16
Q765	G-16
Q766	G-16
Q768	G-16
Q801	C-15
Q803	C-13
Q804	C-13
Q805	E-11
Q806	D-14
Q807	C-10
Q1601	G-8
Q1602	H-8
Q1603	G-8
Q1604	F-7
Q1605	H-14
Q1606	H-9
Q1801	G-17
Q1802	G-17
Q1803	G-17

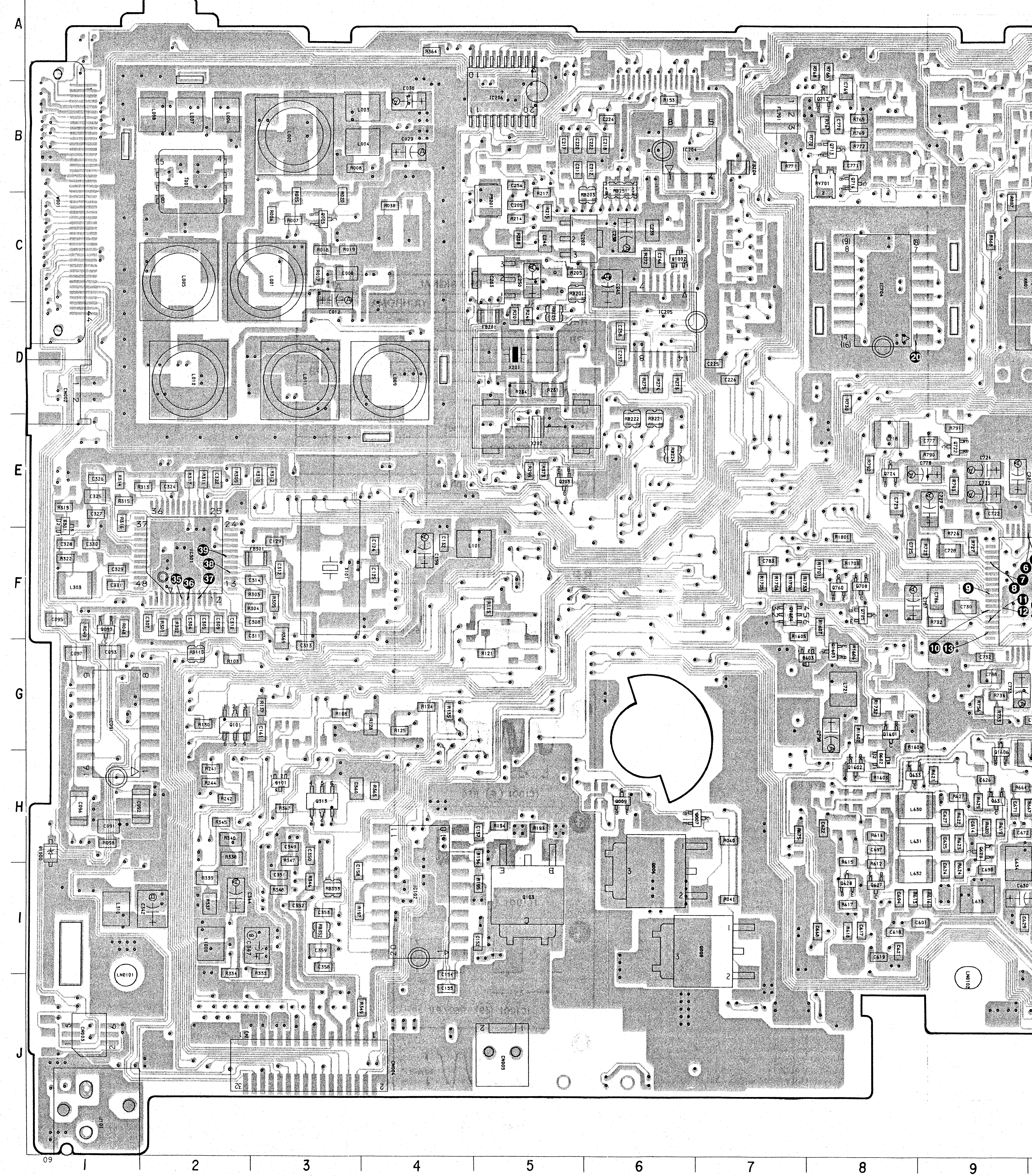
〈 DIODE 〉

D001	8-719-989-33	DIODE FC806
D002	8-719-989-03	DIODE DAN222
D004	8-719-991-00	DIODE DAP222
D101	8-719-989-03	DIODE DAN222
D199	8-719-422-91	DIODE MA8091
D301	8-719-989-00	DIODE DA221
D310	8-719-989-03	DIODE DAN222
D601	8-719-951-22	DIODE IMN10
D602	8-719-989-03	DIODE DAN222
D603	8-719-989-03	DIODE DAN222
D701	8-719-989-03	DIODE DAN222
D1000	8-719-422-91	DIODE MA8091
D1001	8-719-422-91	DIODE MA8091
D1002	8-719-989-03	DIODE DAN222

〈 IC 〉

IC001	8-759-060-94	IC MB3785APFV-G-BND-ER
IC091	8-759-509-13	IC XRU4052BF
IC101	8-752-836-15	IC CXP80624A-010R
IC102	8-759-039-01	IC MPC1720M
IC103	8-759-990-55	IC CXA8006M
IC201	8-759-099-93	IC MB89092-109
IC202	8-759-512-69	IC S-81350HG-KD
IC203	8-759-946-03	IC S-8054ALR-LN-S
IC204	8-759-044-78	IC AK6420F
IC205	8-759-999-02	IC TL1596CDB
IC206	8-759-635-27	IC M62352GP
IC301	8-759-512-42	IC CXA1481R
IC601	8-759-012-00	IC MC10H116M
IC602	8-752-053-21	IC CXA1211M
IC603	8-759-998-32	IC CXD-2107M
IC701	8-752-065-54	IC CXA1207AR
IC702	8-752-053-21	IC CXA1211M
IC703	8-759-636-33	IC CXA1452
IC704	8-752-332-68	IC CXL5502M
IC705	8-759-635-27	IC M62352GP
IC707	8-759-710-86	IC NJM2233BM
IC801	8-752-065-56	IC CXA1208R

MA-137 BOARD (COMPONENT SIDE)

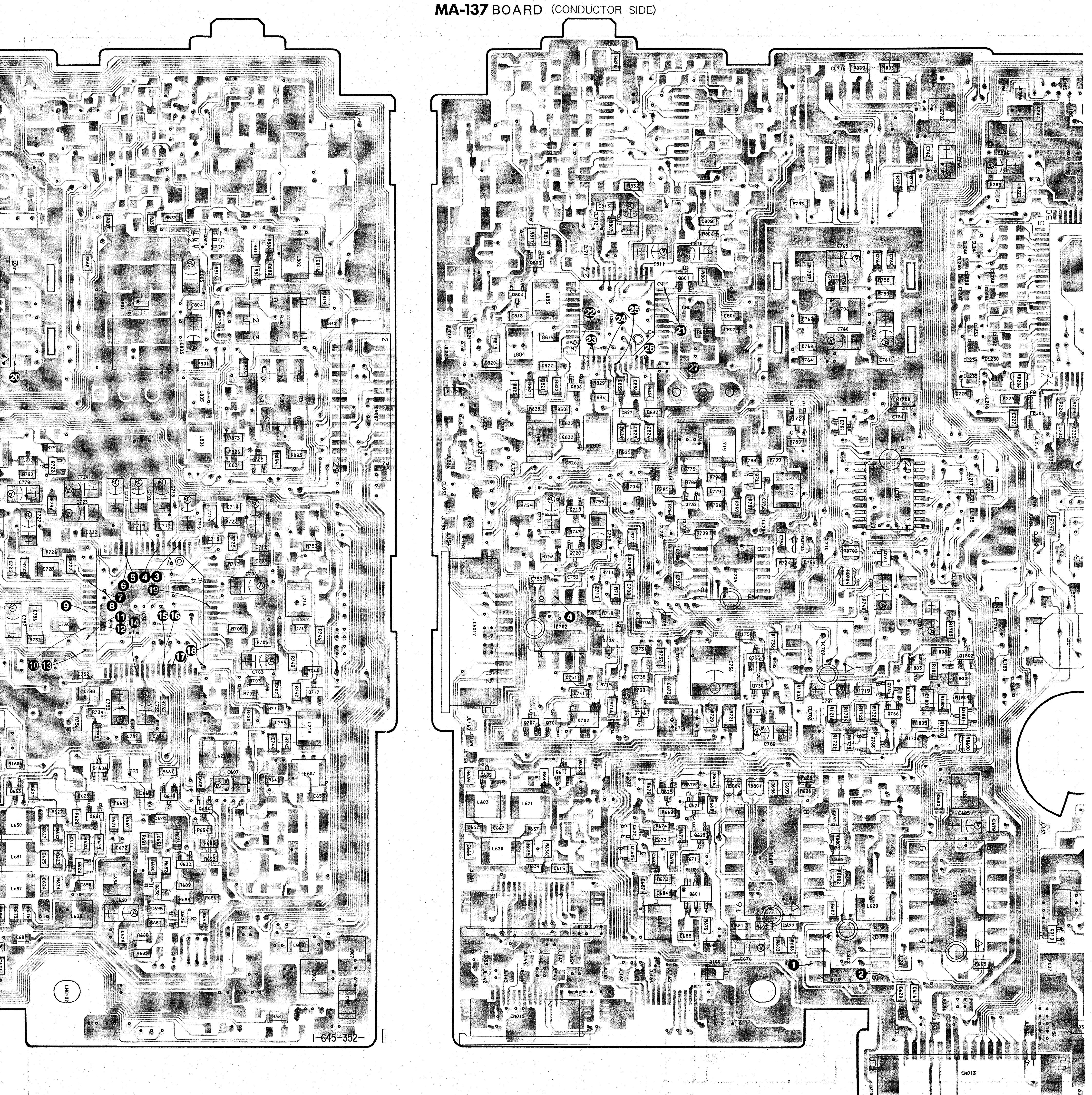


	-752-065-54	IC CXA1207AR
	-752-053-21	IC CXA1211M
	-759-636-33	IC CXA1452
	-752-332-68	IC CXL5502M
	-759-635-27	IC M62352GP
	-759-710-86	IC NJM2233BM
	-752-065-56	IC CXA1208R

(TRANSISTOR)

⚠Q001	8-729-823-84	TRANSISTOR FP102
⚠Q002	8-729-823-84	TRANSISTOR FP102
⚠Q003	8-729-823-84	TRANSISTOR FP102
⚠Q004	8-729-805-25	TRANSISTOR 2SB1121-S
Q005	8-729-927-XX	TRANSISTOR 2SC4617R
⚠Q006	8-752-822-52	TRANSISTOR 2SK1469
Q007	8-729-928-81	TRANSISTOR DTC144EE
⚠Q008	8-752-822-52	TRANSISTOR 2SK1469
Q009	8-729-928-81	TRANSISTOR DTC144EE
Q010	8-729-928-27	TRANSISTOR DTA144EE
Q012	8-729-928-81	TRANSISTOR DTC144EE
Q091	8-729-927-XX	TRANSISTOR 2SC4617R
Q092	8-729-927-XX	TRANSISTOR 2SC4617R
Q093	8-729-927-XX	TRANSISTOR 2SC4617R
Q101	8-729-420-12	TRANSISTOR XN4213
Q103	8-729-820-46	TRANSISTOR 2SB1202FAS
Q202	8-729-927-XX	TRANSISTOR 2SC4617R
Q203	8-729-928-81	TRANSISTOR DTC144EE
Q310	8-729-927-XX	TRANSISTOR 2SC4617R
Q311	8-729-927-65	TRANSISTOR UMT1
Q312	8-729-928-90	TRANSISTOR DTC114EE
Q313	8-729-823-95	TRANSISTOR FC149
Q609	8-729-927-XX	TRANSISTOR 2SC4617R
Q611	8-729-927-XX	TRANSISTOR 2SC4617R
Q619	8-729-928-72	TRANSISTOR DTA114TE
Q621	8-729-928-72	TRANSISTOR DTA114TE
Q622	8-729-927-XX	TRANSISTOR 2SC4617R
Q623	8-729-927-XX	TRANSISTOR 2SC4617R
Q625	8-729-928-72	TRANSISTOR DTA114TE
Q626	8-729-927-XX	TRANSISTOR 2SC4617R
Q627	8-729-927-XX	TRANSISTOR 2SC4617R
Q628	8-729-928-19	TRANSISTOR 2SA1774R
Q629	8-729-928-19	TRANSISTOR 2SA1774R
Q630	8-729-927-XX	TRANSISTOR 2SC4617R
Q631	8-729-927-XX	TRANSISTOR 2SC4617R
Q632	8-729-927-XX	TRANSISTOR 2SC4617R
Q633	8-729-927-XX	TRANSISTOR 2SC4617R
Q634	8-729-928-81	TRANSISTOR DTC144EE
Q701	8-729-928-81	TRANSISTOR DTC144EE
Q702	8-729-202-38	TRANSISTOR 2SC3326N-A
Q703	8-729-202-38	TRANSISTOR 2SC3326N-A
Q705	8-729-928-81	TRANSISTOR DTC144EE
Q706	8-729-928-27	TRANSISTOR DTA144EE
Q707	8-729-928-81	TRANSISTOR DTC144EE
Q708	8-729-928-81	TRANSISTOR DTC144EE
Q712	8-729-928-19	TRANSISTOR
Q713	8-729-927-XX	TRANSISTOR
Q714	8-729-927-XX	TRANSISTOR
Q717	8-729-927-XX	TRANSISTOR
Q719	8-729-927-XX	TRANSISTOR
Q720	8-729-927-XX	TRANSISTOR
Q721	8-729-927-XX	TRANSISTOR
Q722	8-729-927-XX	TRANSISTOR
Q723	8-729-928-27	TRANSISTOR
Q724	8-729-928-19	TRANSISTOR
Q730	8-729-928-81	TRANSISTOR
Q732	8-729-927-XX	TRANSISTOR
Q755	8-729-928-90	TRANSISTOR
Q760	8-729-927-XX	TRANSISTOR
Q761	8-729-927-XX	TRANSISTOR

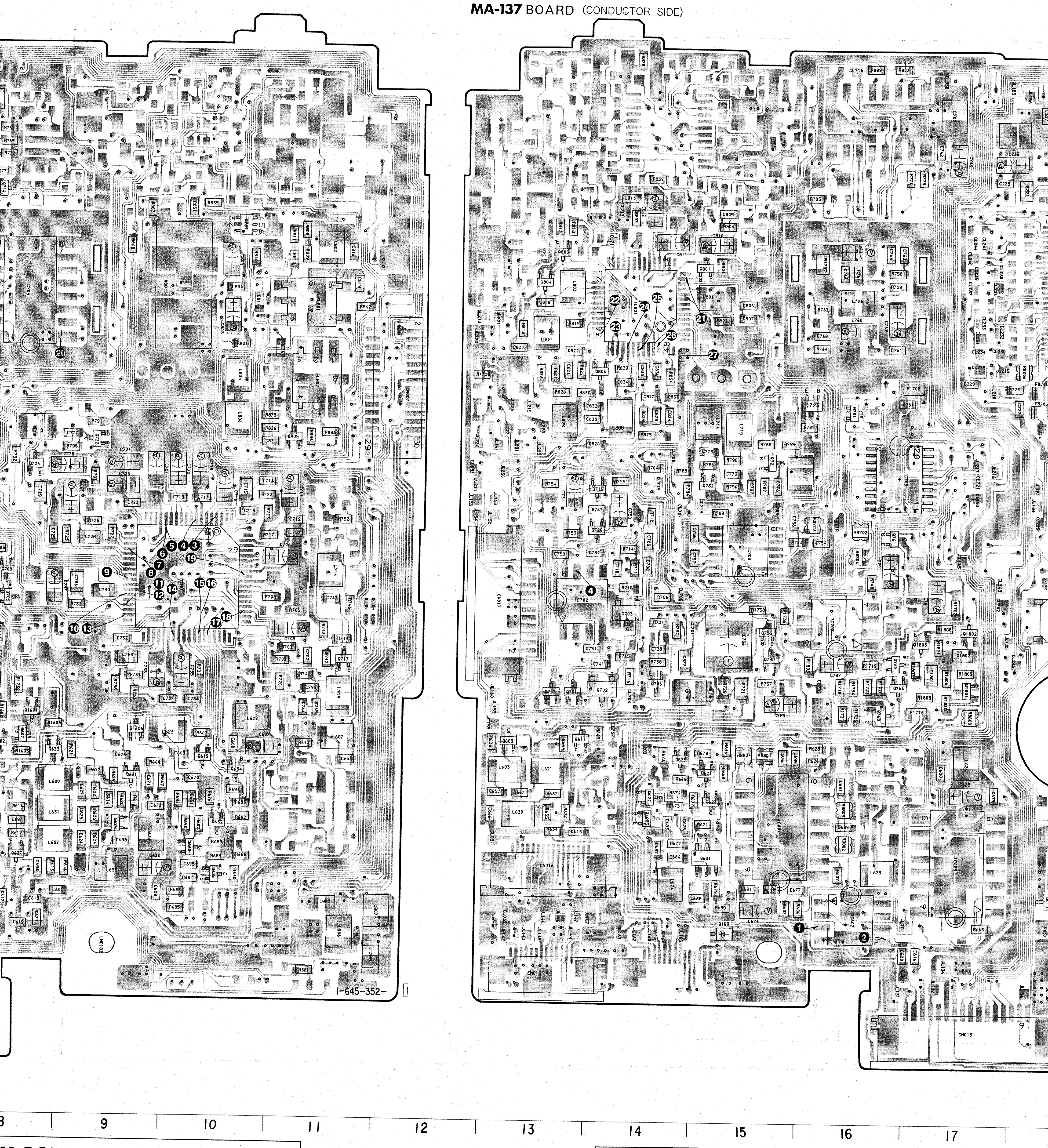
MA-137 BOARD (CONDUCTOR SIDE)



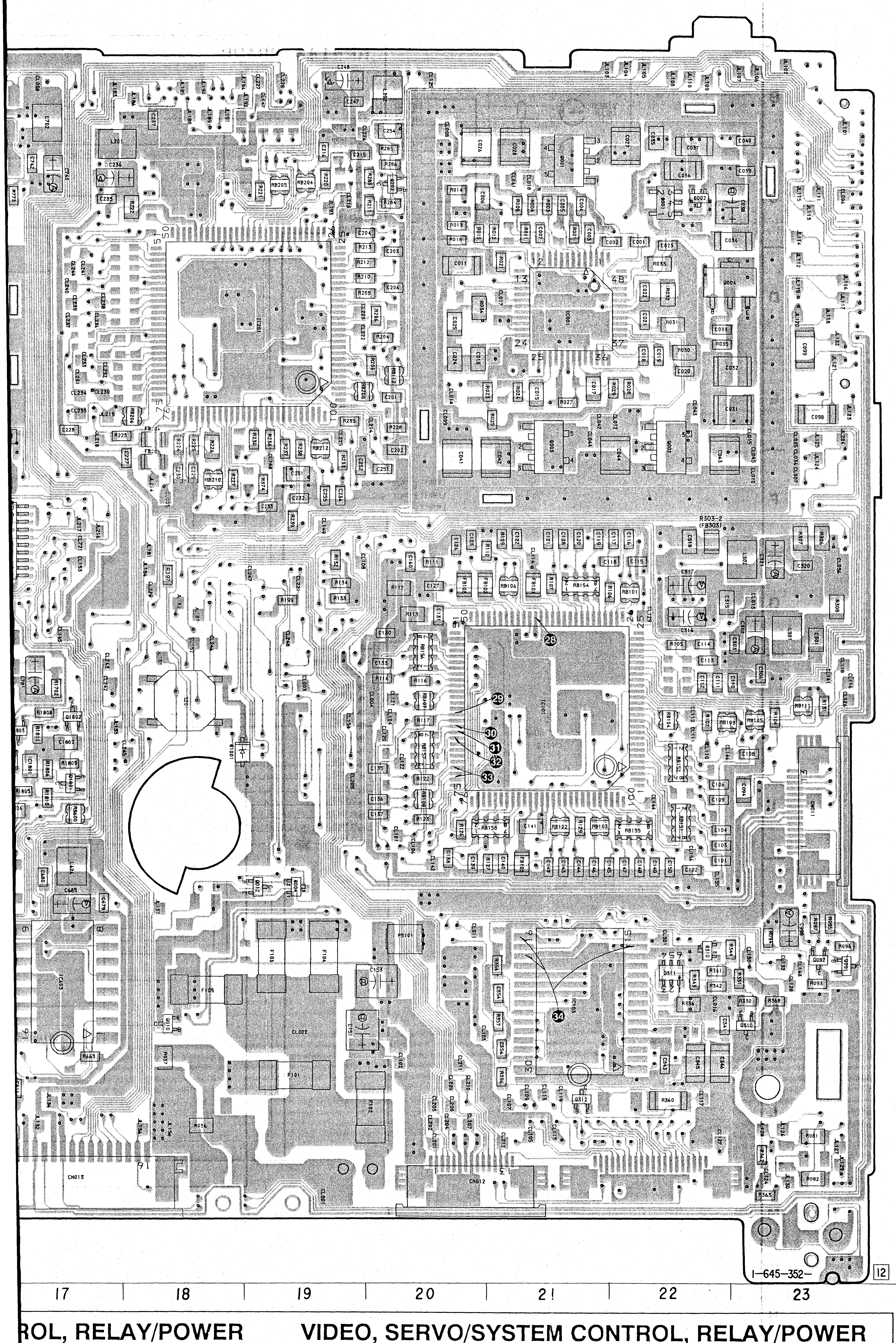
(TRANSISTOR)

IC701	8-752-065-54	IC CXA1207AR
IC702	8-752-053-21	IC CXA1211M
IC703	8-759-636-33	IC CXA1452
IC704	8-752-332-68	IC CXL5502M
IC705	8-759-635-27	IC M62352GP
IC707	8-759-710-86	IC NJM2233BM
IC801	8-752-065-56	IC CXA1208R
⚠Q0001	8-729-823-84	TRANSISTOR FP102
⚠Q0002	8-729-823-84	TRANSISTOR FP102
⚠Q0003	8-729-823-84	TRANSISTOR FP102
⚠Q0004	8-729-805-25	TRANSISTOR 2SB1121-S
Q0005	8-729-927-XX	TRANSISTOR 2SC4617R
⚠Q0006	8-752-822-52	TRANSISTOR 2SK1469
Q0007	8-729-928-81	TRANSISTOR DTC144EE
⚠Q0008	8-752-822-52	TRANSISTOR 2SK1469
Q0009	8-729-928-81	TRANSISTOR DTC144EE
Q0010	8-729-928-27	TRANSISTOR DTA144EE
Q0012	8-729-928-81	TRANSISTOR DTC144EE
Q0091	8-729-927-XX	TRANSISTOR 2SC4617R
Q0092	8-729-927-XX	TRANSISTOR 2SC4617R
Q0093	8-729-927-XX	TRANSISTOR 2SC4617R
Q101	8-729-420-12	TRANSISTOR XN4213
Q103	8-729-820-46	TRANSISTOR 2SB1202FAS
Q202	8-729-927-XX	TRANSISTOR 2SC4617R
Q203	8-729-928-81	TRANSISTOR DTC144EE
Q310	8-729-927-XX	TRANSISTOR 2SC4617R
Q311	8-729-927-65	TRANSISTOR UMT1
Q312	8-729-928-90	TRANSISTOR DTC114EE
Q313	8-729-823-95	TRANSISTOR FC149
Q609	8-729-927-XX	TRANSISTOR 2SC4617R
Q611	8-729-927-XX	TRANSISTOR 2SC4617R
Q619	8-729-928-72	TRANSISTOR DTA114TE
Q621	8-729-928-72	TRANSISTOR DTA114TE
Q622	8-729-927-XX	TRANSISTOR 2SC4617R
Q623	8-729-927-XX	TRANSISTOR 2SC4617R
Q625	8-729-928-72	TRANSISTOR DTA114TE
Q626	8-729-927-XX	TRANSISTOR 2SC4617R
Q627	8-729-927-XX	TRANSISTOR 2SC4617R
Q628	8-729-928-19	TRANSISTOR 2SA1774R
Q629	8-729-928-19	TRANSISTOR 2SA1774R
Q630	8-729-927-XX	TRANSISTOR 2SC4617R
Q631	8-729-927-XX	TRANSISTOR 2SC4617R
Q632	8-729-927-XX	TRANSISTOR 2SC4617R
Q633	8-729-927-XX	TRANSISTOR 2SC4617R
Q634	8-729-928-81	TRANSISTOR DTC144EE
Q701	8-729-928-81	TRANSISTOR DTC144EE
Q702	8-729-202-38	TRANSISTOR 2SC3326N-A
Q703	8-729-202-38	TRANSISTOR 2SC3326N-A
Q705	8-729-928-81	TRANSISTOR DTC144EE
Q706	8-729-928-27	TRANSISTOR DTA144EE
Q707	8-729-928-81	TRANSISTOR DTC144EE
Q708	8-729-928-81	TRANSISTOR DTC144EE
Q712	8-729-928-19	TR
Q713	8-729-927-XX	TR
Q714	8-729-927-XX	TR
Q717	8-729-927-XX	TR
Q719	8-729-927-XX	TR
Q720	8-729-927-XX	TR
Q721	8-729-927-XX	TR
Q722	8-729-927-XX	TR
Q723	8-729-928-27	TR
Q724	8-729-928-19	TRA
Q730	8-729-928-81	TRA
Q732	8-729-927-XX	TRA
Q755	8-729-928-90	TRA
Q760	8-729-927-XX	TRA
Q761	8-729-927-XX	TRA

MA-137 BOARD (CONDUCTOR SIDE)



Q712	8-729-928-19	TRANSISTOR 2SA1774R
Q713	8-729-927-XX	TRANSISTOR 2SC4617R
Q714	8-729-927-XX	TRANSISTOR 2SC4617R
Q717	8-729-927-XX	TRANSISTOR 2SC4617R
Q719	8-729-927-XX	TRANSISTOR 2SC4617R
Q720	8-729-927-XX	TRANSISTOR 2SC4617R
Q721	8-729-927-XX	TRANSISTOR 2SC4617R
Q722	8-729-927-XX	TRANSISTOR 2SC4617R
Q723	8-729-928-27	TRANSISTOR DTA144EE
Q724	8-729-928-19	TRANSISTOR 2SA1774R
Q730	8-729-928-81	TRANSISTOR DTC144EE
Q732	8-729-927-XX	TRANSISTOR 2SC4617R
Q755	8-729-928-90	TRANSISTOR DTC114EE
Q760	8-729-927-XX	TRANSISTOR 2SC4617R
Q761	8-729-927-XX	TRANSISTOR 2SC4617R
Q765	8-729-927-XX	TRANSISTOR 2SC4617R
Q766	8-729-928-19	TRANSISTOR 2SA1774R
Q768	8-729-905-35	TRANSISTOR 2SC4081-R
Q801	8-729-927-XX	TRANSISTOR 2SC4617R
Q803	8-729-928-81	TRANSISTOR DTC144EE
Q804	8-729-927-XX	TRANSISTOR 2SC4617R
Q805	8-729-928-19	TRANSISTOR 2SA1774R
Q806	8-729-927-XX	TRANSISTOR 2SC4617R
Q807	8-729-930-13	TRANSISTOR UMH2
Q1601	8-729-928-19	TRANSISTOR 2SA1774R
Q1602	8-729-928-81	TRANSISTOR DTC144EE
Q1603	8-729-928-19	TRANSISTOR 2SA1774R
Q1604	8-729-930-13	TRANSISTOR UMH2
Q1605	8-729-928-81	TRANSISTOR DTC144EE
Q1606	8-729-928-72	TRANSISTOR DTA114TE
Q1801	8-729-927-XX	TRANSISTOR 2SC4617R
Q1802	8-729-927-XX	TRANSISTOR 2SC4617R
Q1803	8-729-928-27	TRANSISTOR DTA144EE

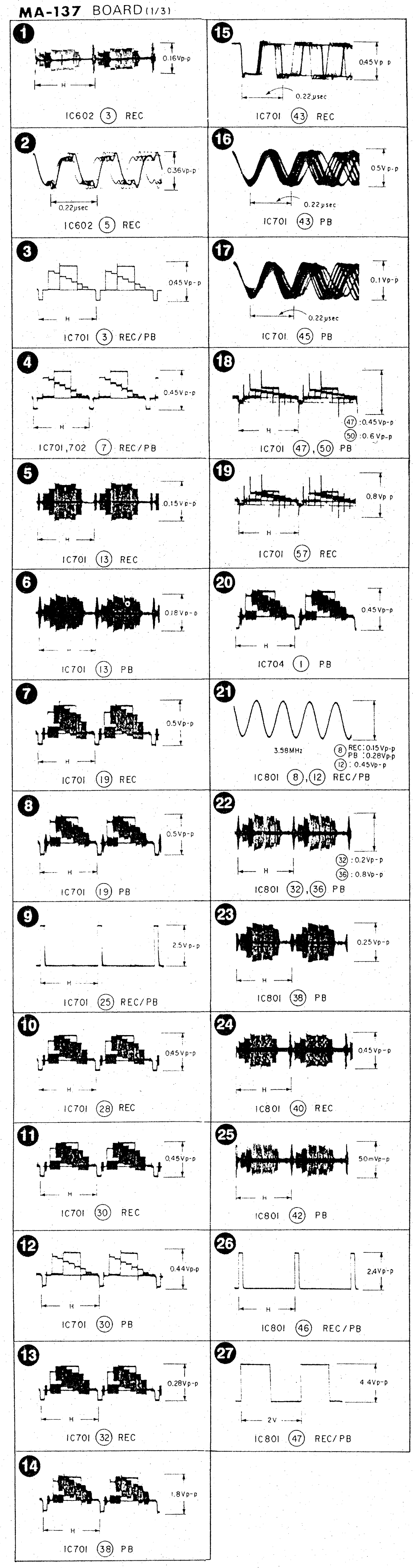


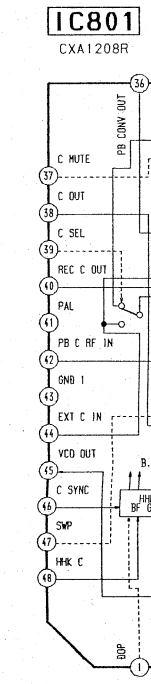
MA-137 (VIDEO) SCHEMATIC DIAGRAM

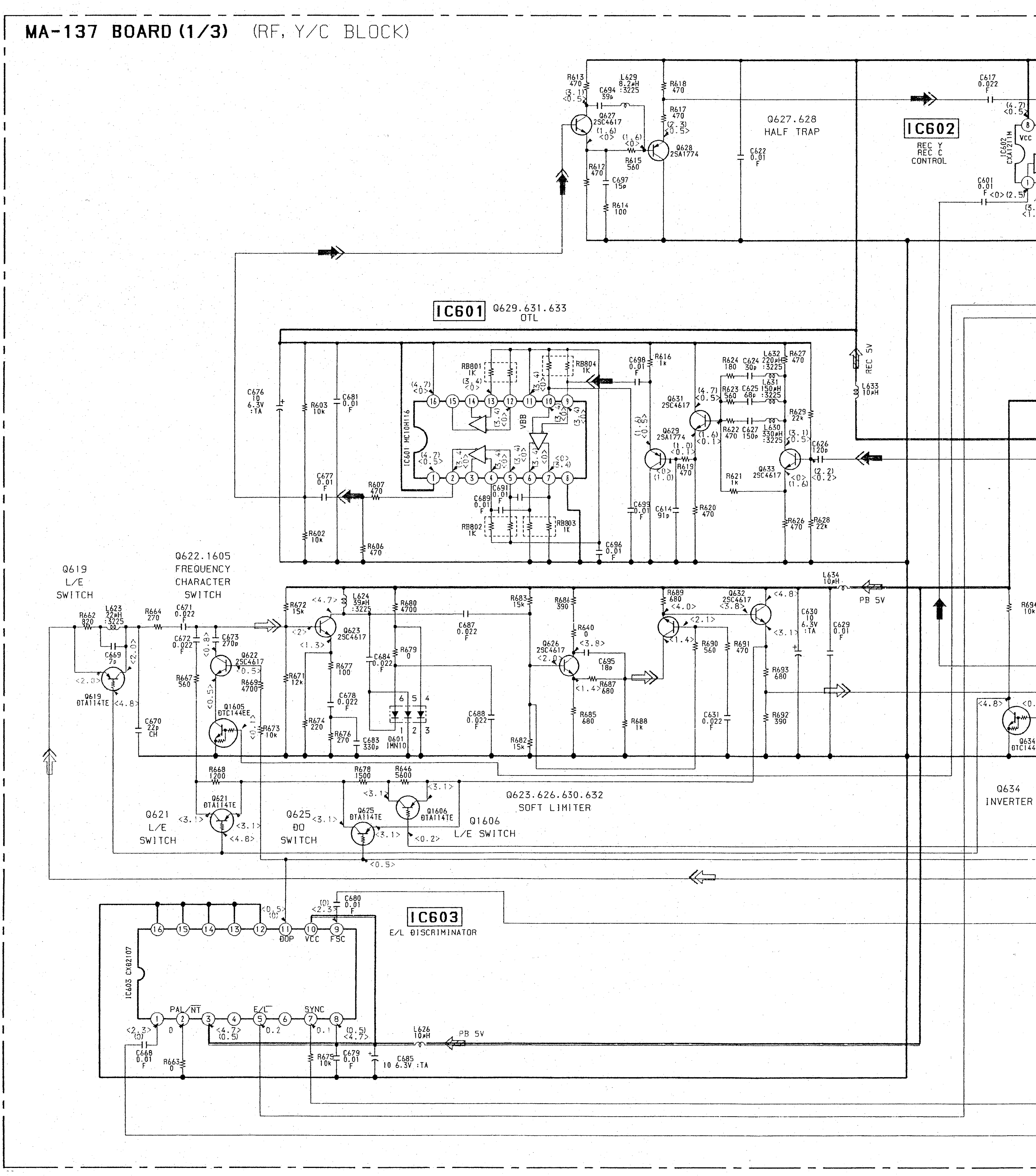
- Refer to page 79 for Printed Wiring Board. (MA-137 Board)

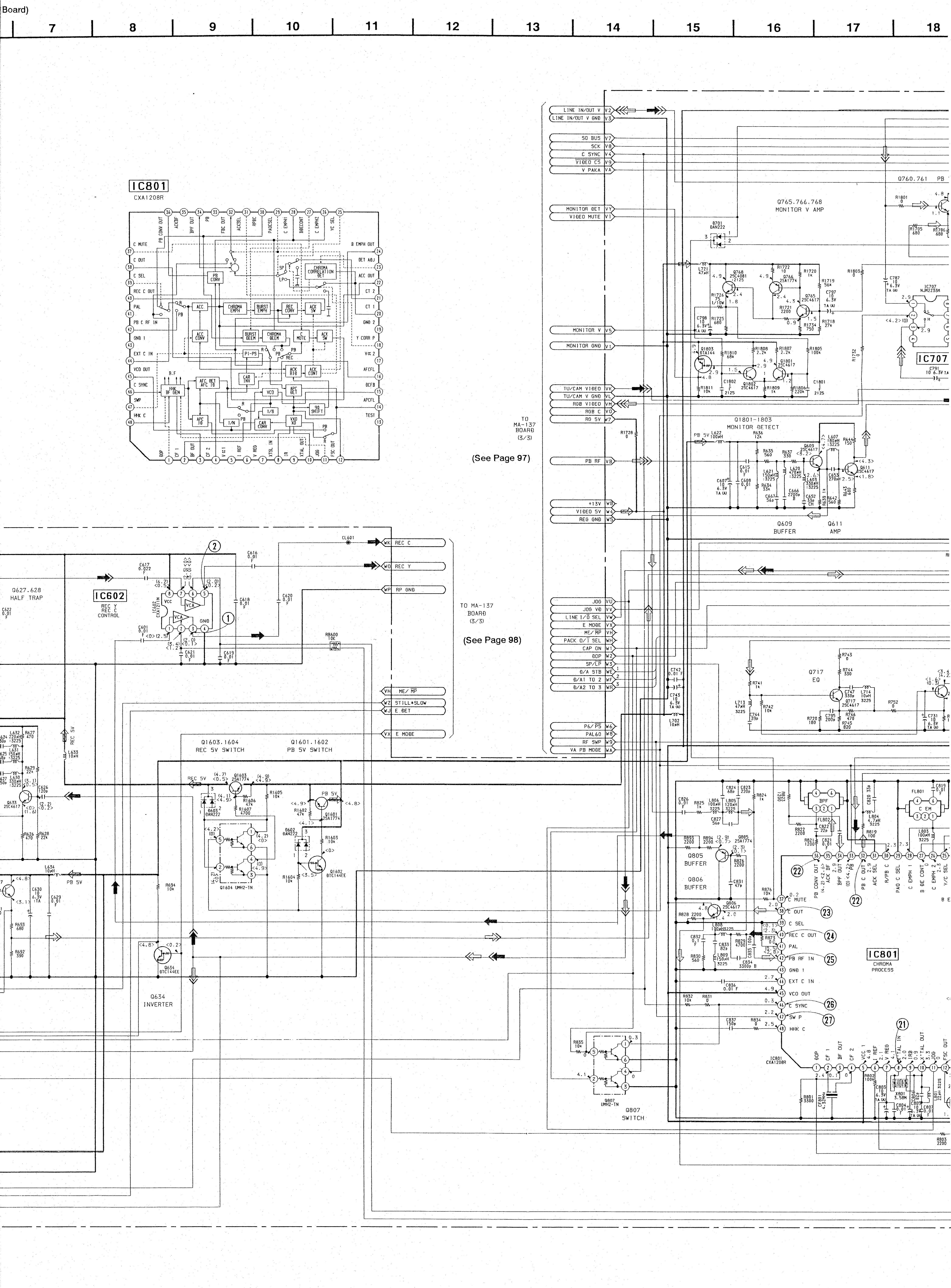
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	
PB	⇨	⇨	⇨	




IC801
CXA1208R
PB CONV OUT
C MUTE
C OUT
C SEL
REC C OUT
PAL
PB C RF IN
GND 1
EXT C IN
VCO OUT
C SYNC
SWP
HHK C
BOP


MA-137 BOARD (1/3) (RF, Y/C BLOCK)
Q627.628
HALF TRAP
IC602
REC Y
REC C
CONTROL
IC601 Q629.631.633
OTL
IC601 MC10H116
VBB
REC 5V
Q619
L/E
SWITCH
Q622.1605
FREQUENCY
CHARACTER
SWITCH
Q621
L/E
SWITCH
Q625
BD
SWITCH
Q1606
L/E SWITCH
Q623.626.630.632
SOFT LIMITER
PB 5V
Q634
INVERTER
IC603
E/L DISCRIMINATOR
IC603 CX82107
PAL/NT
E/L
SYNC
BOP
VCC
FSC
PB 5V


Board)
7
8
9
10
11
12
13
14
15
16
17
18
IC801
CXA1208R
IC602
REC Y
REC C
CONTROL
CXA1211M
Q627.628
HALF TRAP
Q1603.1604
REC 5V SWITCH
Q1601.1602
PB 5V SWITCH
Q634
INVERTER
REC 5V
PB 5V
TO MA-137 BOARD (3/3)
(See Page 97)
(See Page 98)
REC C
REC Y
RP GND
ME/MP
STILL•SLOW
E BET
E MODE
LINE IN/OUT V
LINE IN/OUT V GND
SO BUS
SCK
C SYNC
VIDEO CS
V PAKA
MONITOR BET
VIDEO MUTE
MONITOR V
MONITOR GND
TU/CAM VIDEO
TU/CAM V GND
RGB VIDEO
RGB C
RG 5V
PB RF
+13V
VIDEO 5V
REG GND
JOG
JOG VO
LINE I/O SEL
PACK O/I SEL
CAP ON
BOP
SP/LP
O/A STB
O/A1 TO 2
O/A2 TO 3
P6/P5
PAL60
RF SWP
VA PB MODE
Q765.766.768
MONITOR V AMP
Q760.761 PB
IC707
NJM2233M
Q1801-1803
MONITOR DETECT
Q609
BUFFER
Q611
AMP
Q717
EQ
Q805
BUFFER
Q806
BUFFER
Q807
SWITCH
IC801
CHROMA
PROCESS
PB CONV OUT
ACK BF
BPF OUT
PB C OUT
ACK SEL
R/PB C
PAO C SEL
C EMPH 1
B BE CONT
C EMPH 2
Y/C SEL
C MUTE
C OUT
C SEL
REC C OUT
PAL
PB RF IN
GND 1
EXT C IN
VCO OUT
C SYNC
SW P
HHK C
BOP
CF 1
BF OUT
CF 2
VCC 1
I REF
V REG
X'TAL IN
IRB
X'TAL OUT
JOG
FSC OUT
CF801
4.43MHz
X801
3.58M
BPF
C EM
FL801
FL802
①
②
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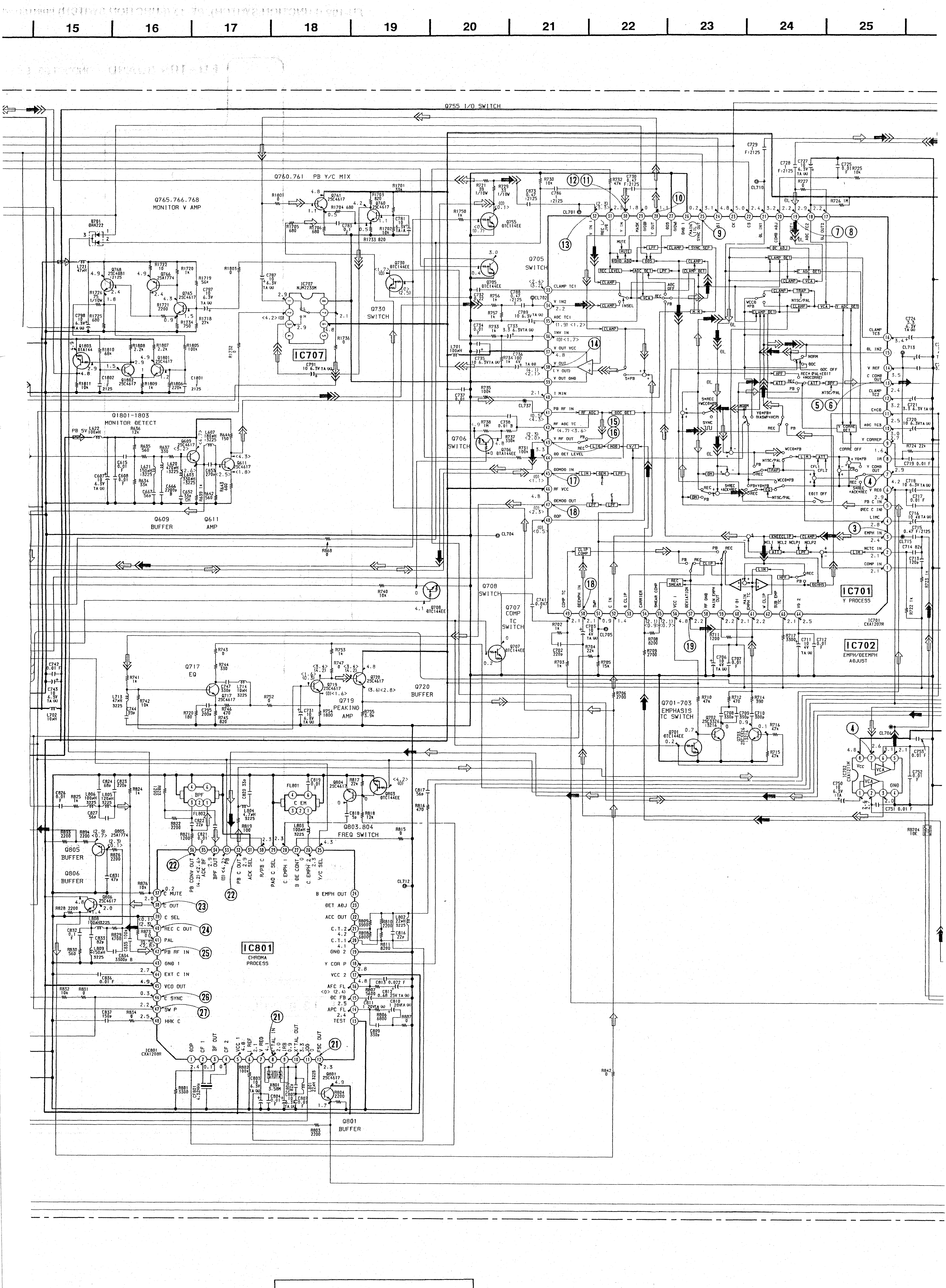
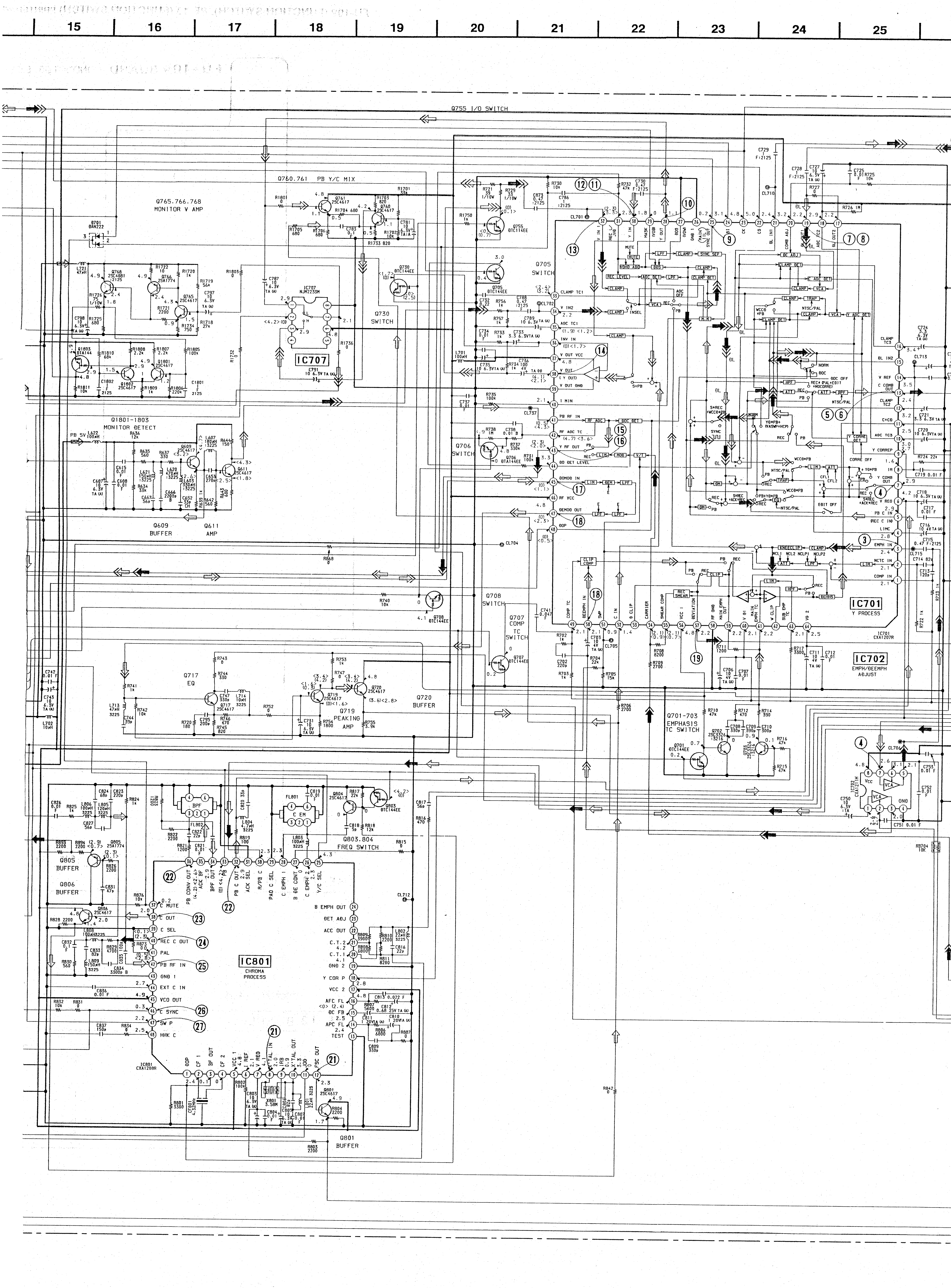
㉗
VID

15
16
17
18
19
20
21
22
23
24
25
Q755 I/O SWITCH
Q760.761 PB Y/C MIX
Q765.766.768 MONITOR V AMP
Q705 SWITCH
Q730 SWITCH
IC707 NJM2233M
Q1801-1803 MONITOR DETECT
Q609 BUFFER
Q611 AMP
Q706 SWITCH
Q708 SWITCH
Q707 COMP TC SWITCH
IC701 Y PROCESS
IC701 CXA1207R
IC702 EMPH/DEEMPH ADJUST
IC702 CXA1211M
Q701-703 EMPHASIS TC SWITCH
Q717 EQ
Q719 PEAKING AMP
Q720 BUFFER
Q803.804 FREQ SWITCH
Q805 BUFFER
Q806 BUFFER
IC801 CHROMA PROCESS
IC801 CXA1208R
Q801 BUFFER
BPF
C EM
FL801
FL802
V IN 1
REC Y/C
Y IN
MASK
VOB
Y OUT
BOS
GND 1
MAIN SYNC OUT
SI
CK
CS
OL IN1
COMB ADJ
OL OUT1
AGC TC2
OL OUT2
CLAMP TC3
OL IN2
V REF
C COMB OUT
CLAMP TC2
C+CO
AGC TC3
Y CORREP
IR
Y COMB OUT
REC C IN
PB C IN
LIMC
EMPH IN
NCTC IN
COMP IN
CLAMP TC1
V IN2
AGC TC1
INV IN
V OUT VCC
V OUT
V OUT GND
I MIN
PB RF IN
RF AGC TC
Y RF OUT
DO DET LEVEL
DEMOD IN
RF VCC
DEMOD OUT
DOP
COMP TC
DEEMPH IN
SWP
C IN
B CLIP
CARRIER
SMEAR COMP
VCC 1
DEVIATION
RF GND
MAIN EMPH OUT
V 01
MAIN EMPH TC
W CLIP
SUB EMP TC
VO 2
PB CONV OUT
ACK BF
BPF OUT
PB C OUT
ACK SEL
R/PB C
PAO C SEL
C EMPH 1
B DE CONT
C EMPH 2
Y/C SEL
B EMPH OUT
DET ADJ
ACC OUT
C.T.2
C.T.1
GND 2
Y COR P
VCC 2
AFC FL
DC FB
APC FL
TEST
C MUTE
C OUT
C SEL
REC C OUT
PAL
PB RF IN
GND 1
EXT C IN
VCO OUT
C SYNC
SW P
HHK C
DOP
CF 1
BF OUT
CF 2
VCC 1
I REF
V REG
X'TAL IN
IRB
X'TAL OUT
JOG
FSC OUT
CLAMP
SYNC SEP
LPF
VCA
AGC DET
REC LEVEL
NORM
DOC
DOC DET
RF AGC
LIM
DEM
MOD
CLIP COMP
KNEECLIP
BEEMPH
REC SHEAR
HPF
ATT
TRAP
NTSC/PAL
Y CORRE DET


15
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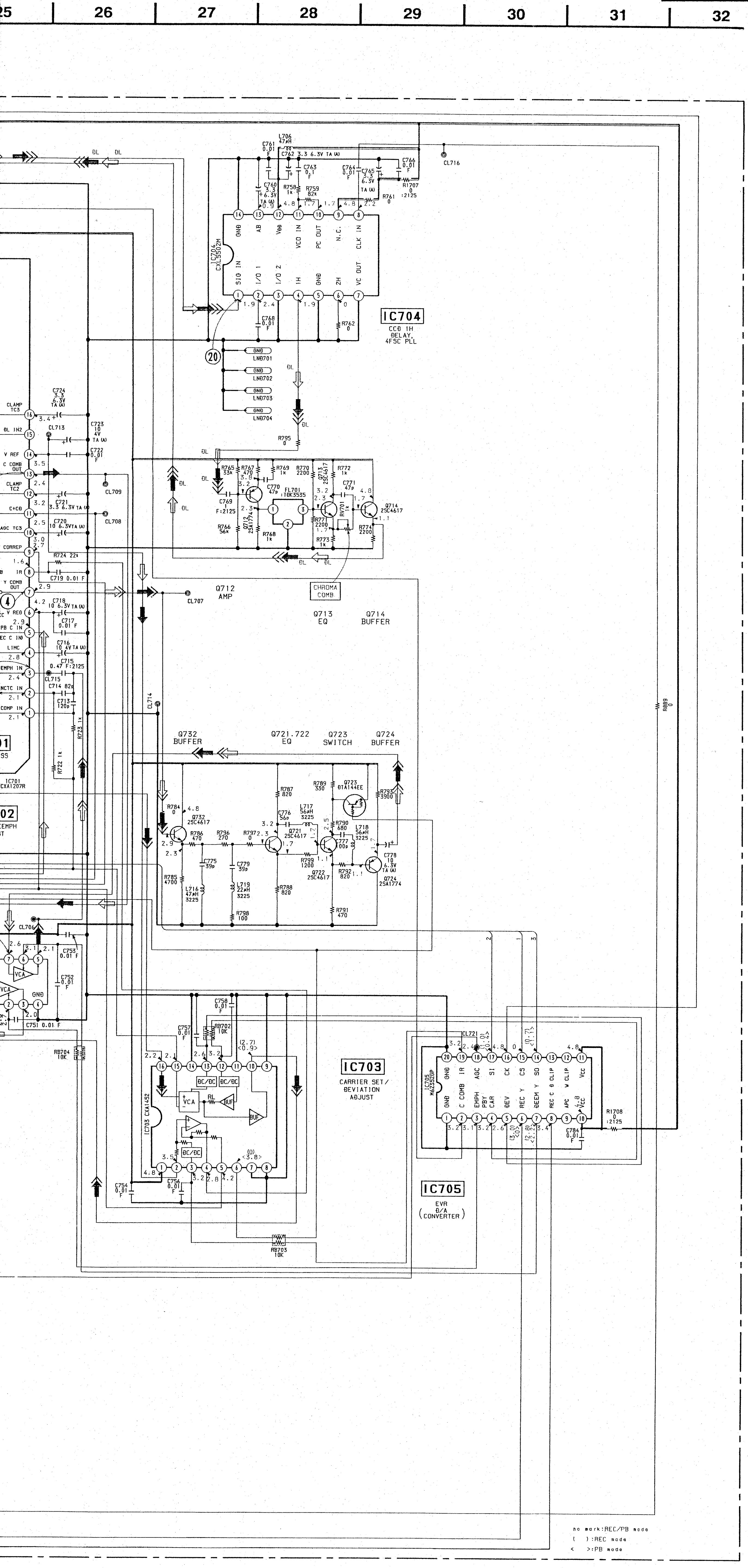
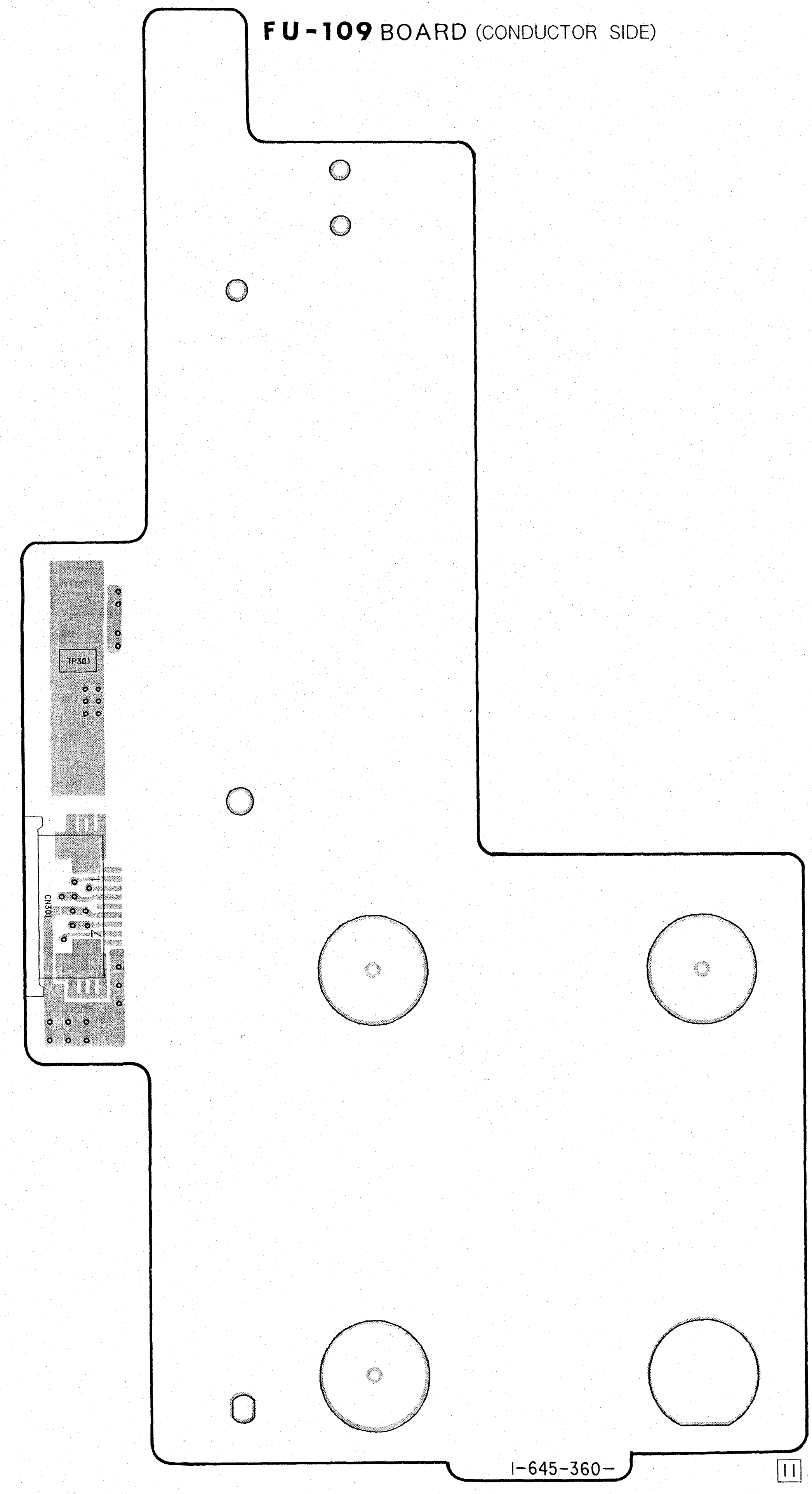
22
23
24
25
Q755 I/O SWITCH
Q765.766.768 MONITOR V AMP
Q760.761 PB Y/C MIX
Q730 SWITCH
IC707 NJM2233M
Q705 SWITCH
Q1801-1803 MONITOR DETECT
Q609 BUFFER
Q611 AMP
Q706 SWITCH
Q708 SWITCH
Q707 COMP TC SWITCH
IC701 Y PROCESS
IC701 CXA1207R
IC702 EMPH/DEEMPH ADJUST
IC702 CXA1211M
Q717 EQ
Q719 PEAKING AMP
Q720 BUFFER
Q701-703 EMPHASIS TC SWITCH
Q805 BUFFER
Q806 BUFFER
Q803.804 FREQ SWITCH
IC801 CHROMA PROCESS
IC801 CXA1208R
Q801 BUFFER

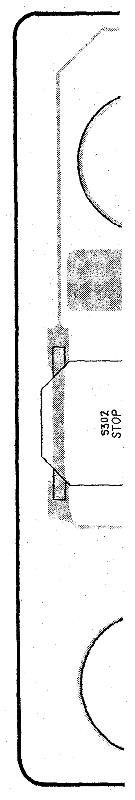

25
26
27
28
29
30
31
32
IC704
CXL5502M
CCD 1H DELAY, 4FSC PLL
SIG IN
I/O 1
I/O 2
1H
GND
2H
VC OUT
GND
AB
VDD
VCO IN
PC OUT
N.C.
CLK IN
Q712 AMP
Q713 EQ
Q714 BUFFER
CHROMA COMB
Q732 BUFFER
Q721.722 EQ
Q723 SWITCH
Q724 BUFFER
IC703
CXA1452
CARRIER SET/ DEVIATION ADJUST
VCA
BUF
IC705
M62352GP
EVR D/A (CONVERTER)
GND
C COMB
EMPH PBY
CAR
DEV
REC Y
DEEM Y
REC C B CLIP
APC
Vcc
IR
AGC
SI
CK
CS
SO
W CLIP
IC701
CXA1207R
R889
RB703 10K
RB704 10K
R1708
CL716
CL714
CL707
no mark:REC/PB mode
( ):REC mode
< >:PB mode

FU-109 (FUNCTION SWITCH), PE-13 (FUNCTION SWITCH) PRINTED WIRING BOARDS

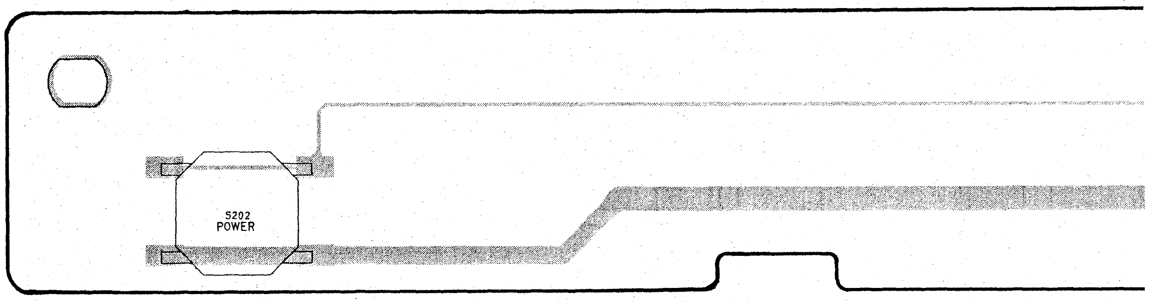
FU-109 BOARD (CONDUCTOR SIDE)


TP301
CN301
1-645-360-
11

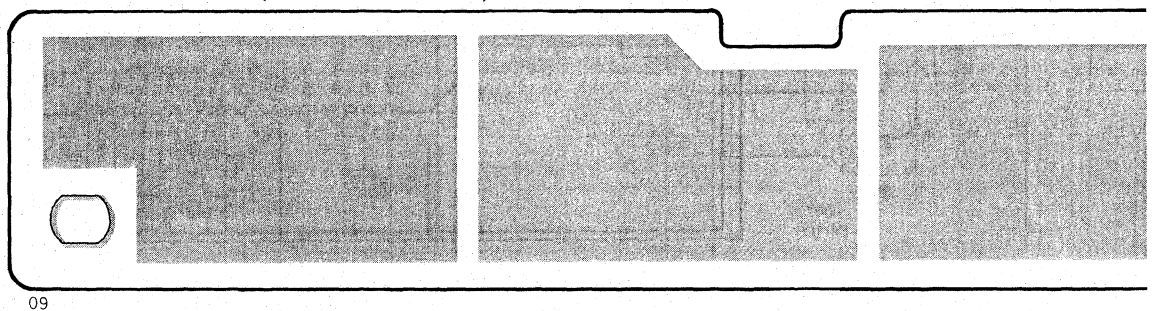
FU-1(



PE-13 BOARD (COMPONENT SIDE)



PE-13 BOARD (CONDUCTOR SIDE)

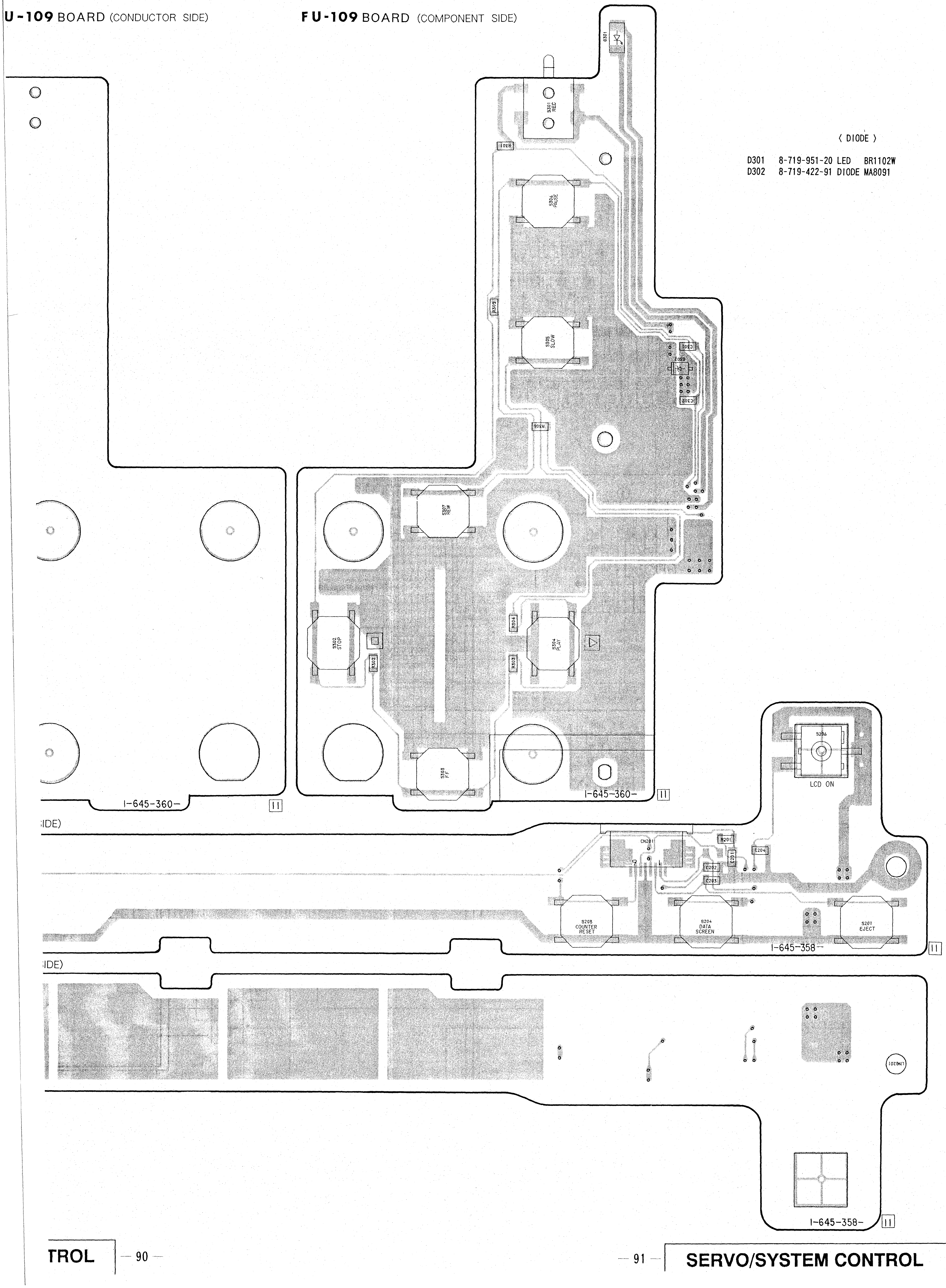


-88- -89-

, PE-13 (FUNCTION SWITCH) PRINTED WIRING BOARDS

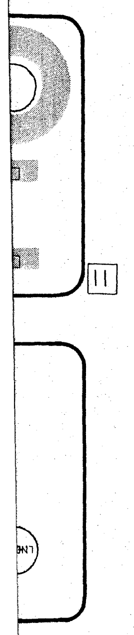
U-109 BOARD (CONDUCTOR SIDE)

FU-109 BOARD (COMPONENT SIDE)


D301
S301
REC
R301
S306
PAUSE
R309
S305
SLOW
C301
D302
C302
R306
S307
REW
S302
STOP
R302
R304
S304
PLAY
R303
S303
FF
1-645-360-
11
S206
LCD ON
;IDE)
CN201
R201
C201
C202
C203
C204
S203
COUNTER
RESET
S204
DATA
SCREEN
S201
EJECT
1-645-358-
LN0201

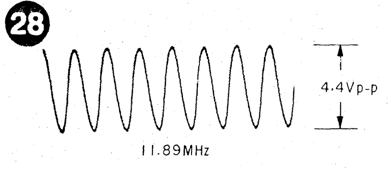
〈 DIODE 〉

D301	8-719-951-20	LED	BR1102W
D302	8-719-422-91	DIODE	MA8091



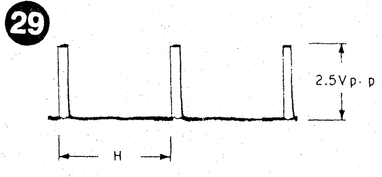
MA-137 BOARD (2/3)

㉘



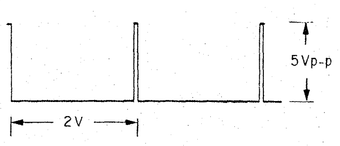
IC101 ㊵ REC/PB

㉙



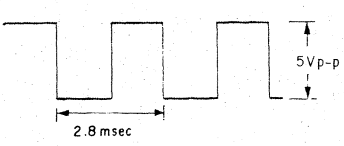
IC101 (64) REC/PB

㉚



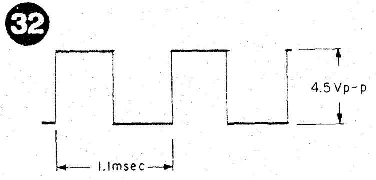
IC101 (66) REC/PB

㉛



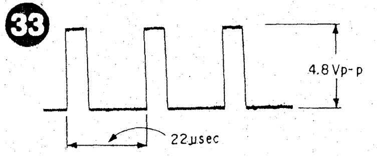
IC101 (67) REC/PB

㉜



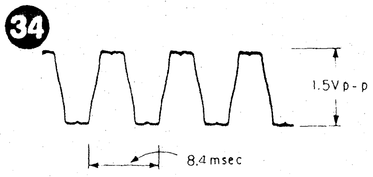
IC101 (68) REC/PB

㉝



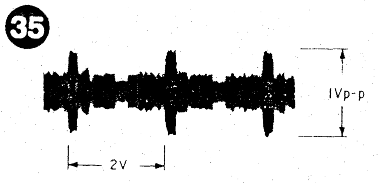
IC101 (73), (75) REC/PB

㉞



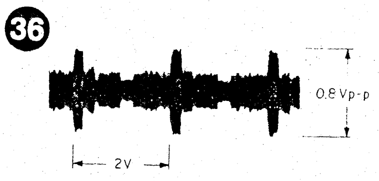
IC103 ⑭, ⑯, ⑱ REC/PB

㉟



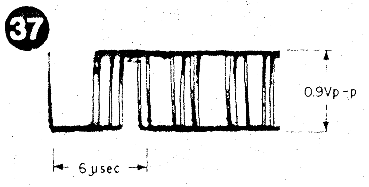
IC301 ⑥ PB

㊱



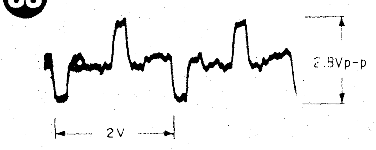
IC301 ⑦ PB

㊲



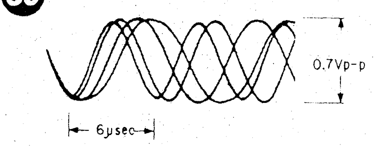
IC301 ⑨ REC/PB

㊳



IC301 ⑮ PB

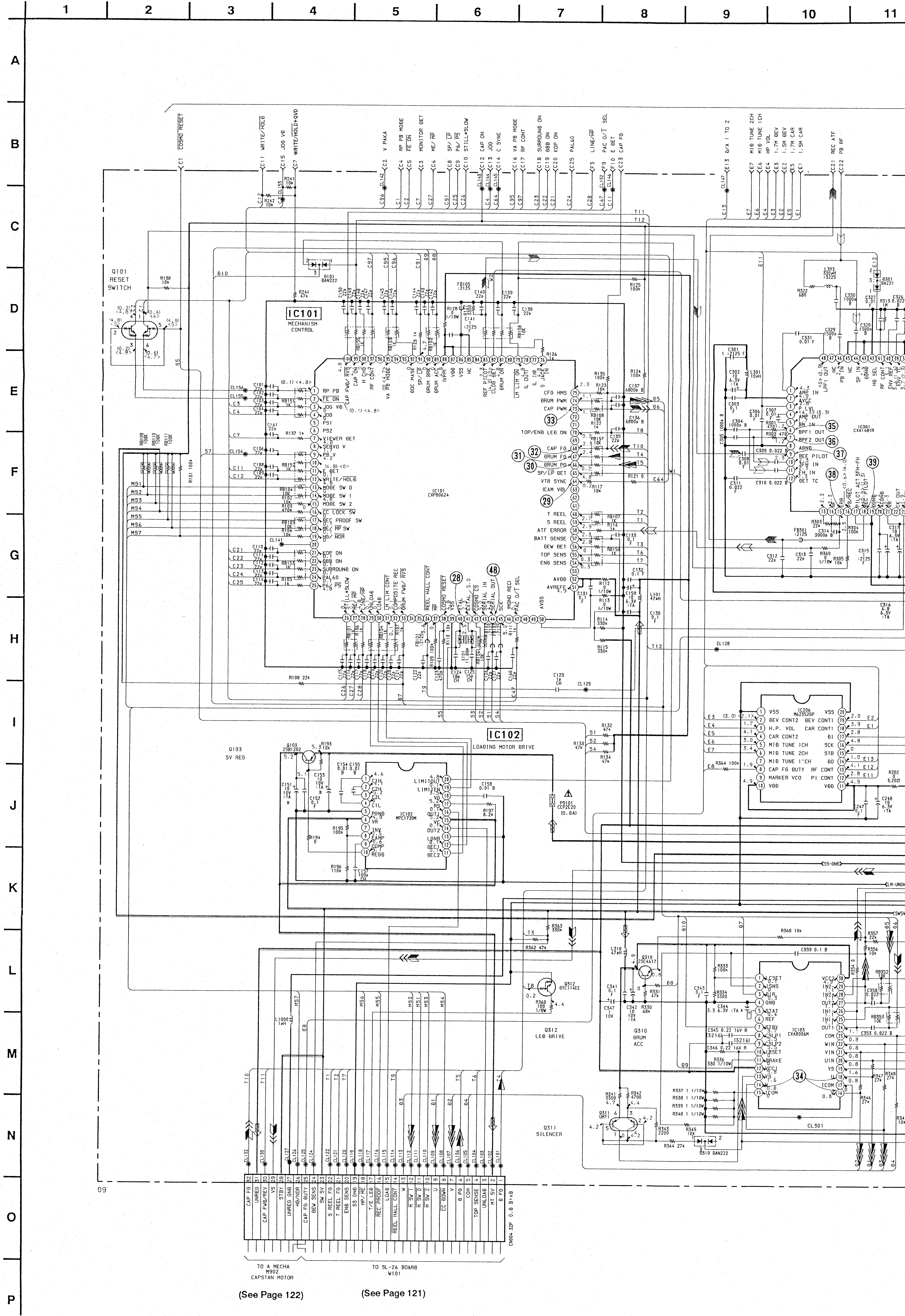
㊴



IC301 ⑱ REC

MA-137 (SERVO/SYSTEM CONTROL), FU-109 (FUNCTION SWITCH), PE-13 (FUNCTION SWITCH) SCHEMATIC DIAGRAMS

- Refer to page 79 for Printed Wiring Boar

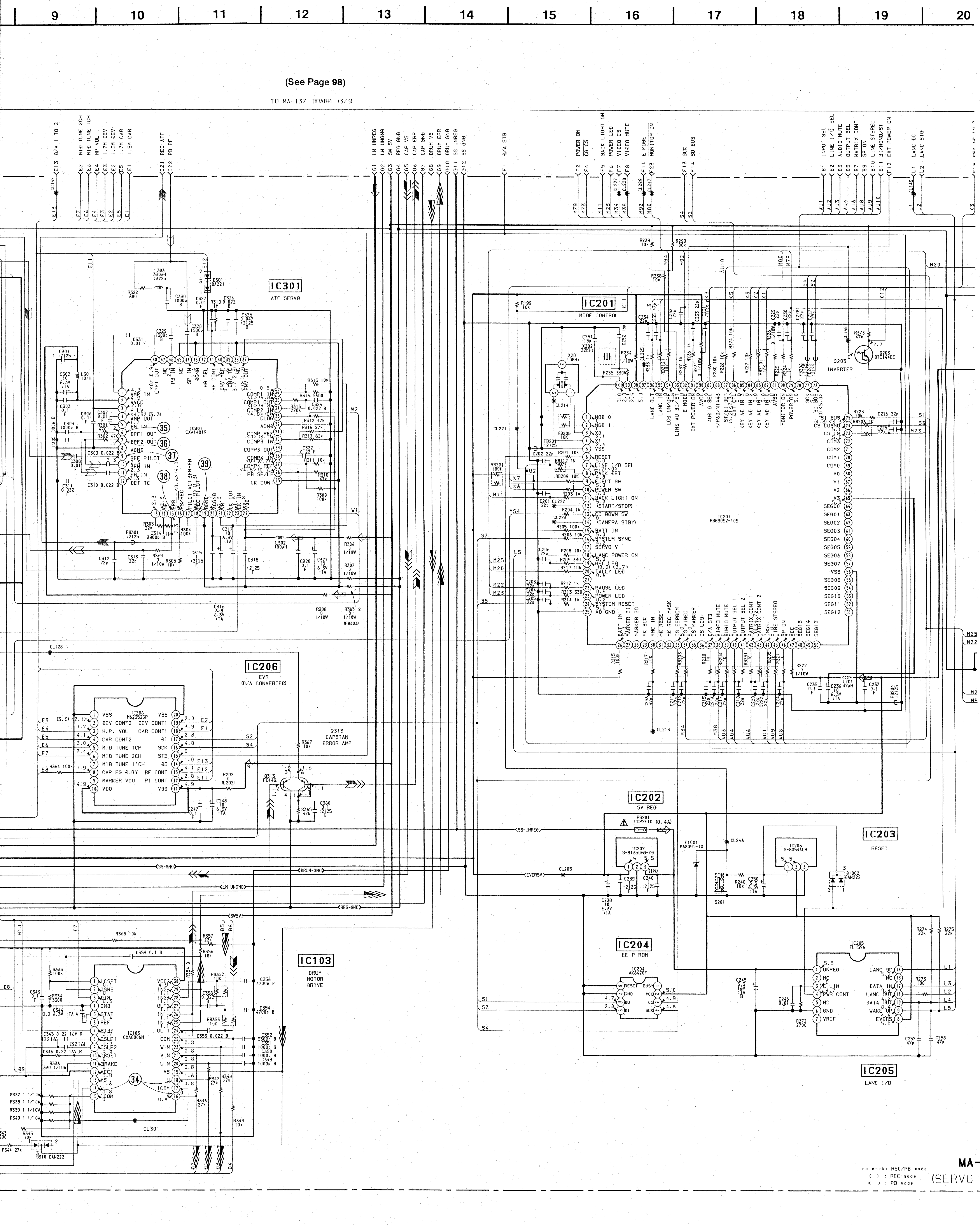


IC101
MECHANISM CONTROL
IC101 CXP80624
IC102
LOADING MOTOR DRIVE
IC102 MPC1720M
IC103 CXA8006M
IC206 M62352GP
IC301 CXA1481R
Q101 RESET SWITCH
Q103 5V REG
Q310 DRUM ACC
Q311 SILENCER
Q312 LED DRIVE
D101 DAN222
D310 DAN222
PS101 CCP2E20 (0.8A)
CN004 32P 0.8 B1eB
COSMO RESET
WRITE/HOLD
JOG VD
WRITE/HOLD+QVD
V PAKA
RP PB MODE
FE ON
MONITOR DET
ME/ MP
SP/ LP
P6/ P5
STILL+SLOW
CAP ON
JOG
C SYNC
VA PB MODE
RF CONT
SURROUND ON
DBB ON
KOP ON
PAL60
LINE/HP
PAC O/T SEL
E DET
CAP FG
D/A 1 TO 2
MID TUNE 2CH
MID TUNE 1CH
HP VOL
1.7M DEV
1.5M DEV
1.7M CAR
1.5M CAR
REC ATF
PB RF
CAP FG
UNREG
CAP FWD/REV
VS
STBY
UNREG GND
HG/NOR
CAP FG DUTY
DEW SENS
SW 5V
S REEL FG
T REEL FG
END SENS
SS GND
MP/ME
T/E LED
REC PROOF
LOAD
REEL HALL CONT
W
M SW 1
M SW 0
M SW 2
U
CC DOWN
V
D PG
COM
TOP SENSE
UNLOAD
MT 5V
D FG
TO A MECHA M902 CAPSTAN MOTOR
TO SL-26 BOARD W101

(See Page 122)

(See Page 121)

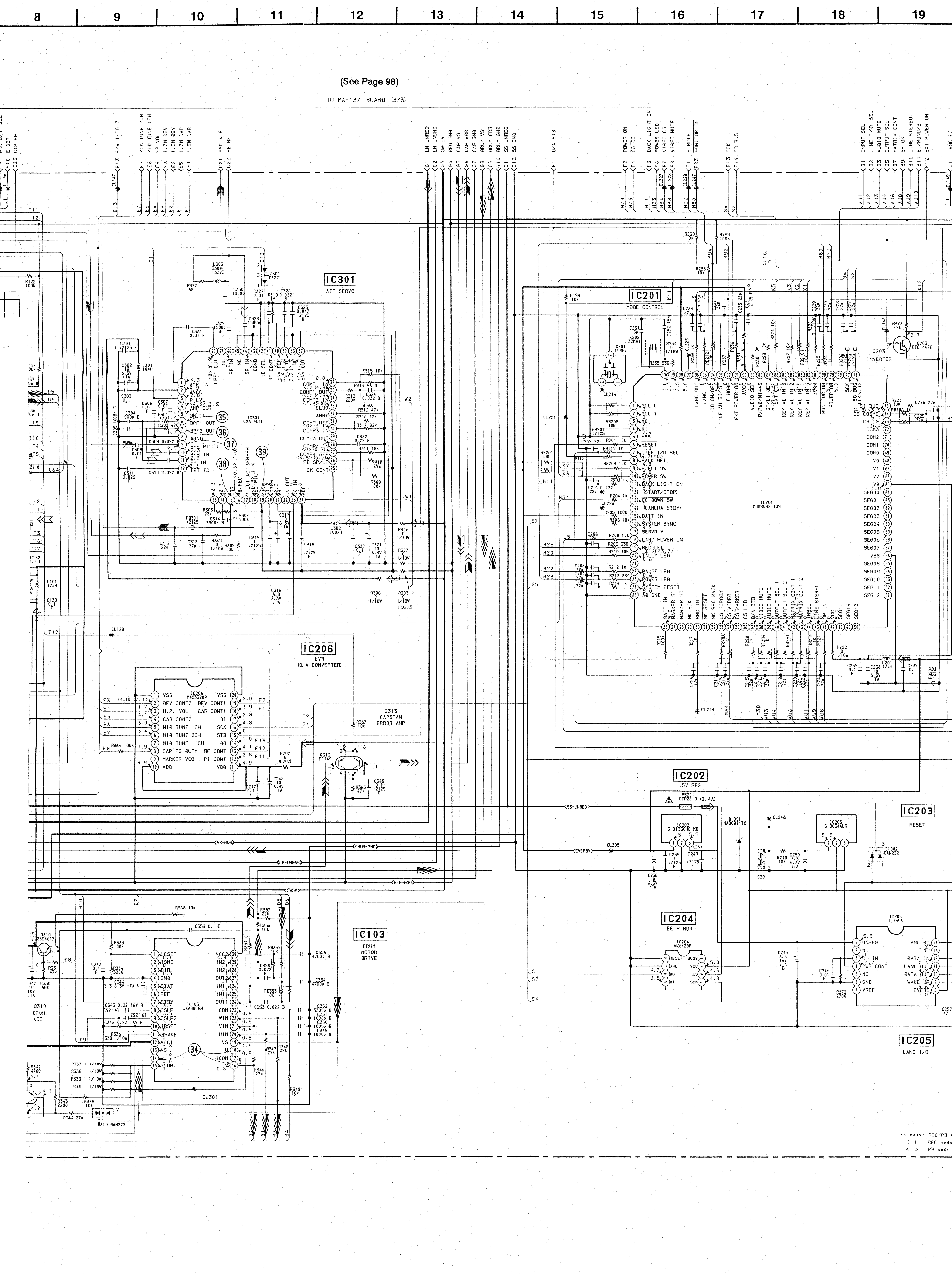
- Refer to page 79 for Printed Wiring Board. (MA-137 Board)


9
10
11
12
13
14
15
16
17
18
19
20
(See Page 98)
TO MA-137 BOARD (3/3)
E13 Ø/A 1 TO 2
E7 MIØ TUNE 2CH
E6 MIØ TUNE 1CH
E4 HP VOL
E3 1.7M ØEV
E2 1.5M ØEV
E5 1.7M CAR
E1 1.5M CAR
C21 REC ATF
C22 PB RF
G1 LM UNREG
G2 LM UNGNØ
G3 SW 5V
G4 REG GNØ
G5 CAP VS
G6 CAP ERR
G7 CAP GNØ
G8 ØRUM VS
G9 ØRUM ERR
G10 ØRUM GNØ
G11 SS UNREG
G12 SS GNØ
F1 Ø/A STB
F2 POWER ON
F4 CG CS
F5 BACK LIGHT ON
F6 POWER LED
F7 VIDEO CS
F8 VIDEO MUTE
F11 E MODE
F23 MONITOR ON
F13 SCK
F14 SO BUS
B1 INPUT SEL
B2 LINE I/O SEL
B3 AUDIO MUTE
B5 OUTPUT SEL
B7 MATRIX CONT
B9 SP ON
B10 LINE STEREO
B11 BI/MONO/ST
F12 EXT POWER ON
L1 LANC ØC
L2 LANC SIG
IC301
ATF SERVO
IC301 CXA1481R
IC201
MODE CONTROL
IC201 MB89092-109
IC206
EVR
(Ø/A CONVERTER)
IC206 M62352GP
Q313
CAPSTAN ERROR AMP
Q313 FC149
IC202
5V REG
IC202 S-81350HG-KØ
PS201 CCP2E10 (0.4A)
IC203
RESET
IC203 S-8054ALR
IC204
EE P ROM
IC204 AK6420F
IC205
LANC I/O
IC205 TL1596
IC103
ØRUM MOTOR ØRIVE
IC103 CXA8006M
Q203
INVERTER
Q203 DTC144EE
X201 10MHz
X202 32KHz
D101 MA8091-TX
D102 ØAN222
D301 ØA221
D310 ØAN222
S201
CL301
(SS-UNREG)
(EVERSV)
(SS-GNØ)
(ØRUM-GNØ)
(LM-UNGNØ)
(REG-GNØ)
(SW5V)
34
35
36
37
38
39

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

MA-
(SERVO

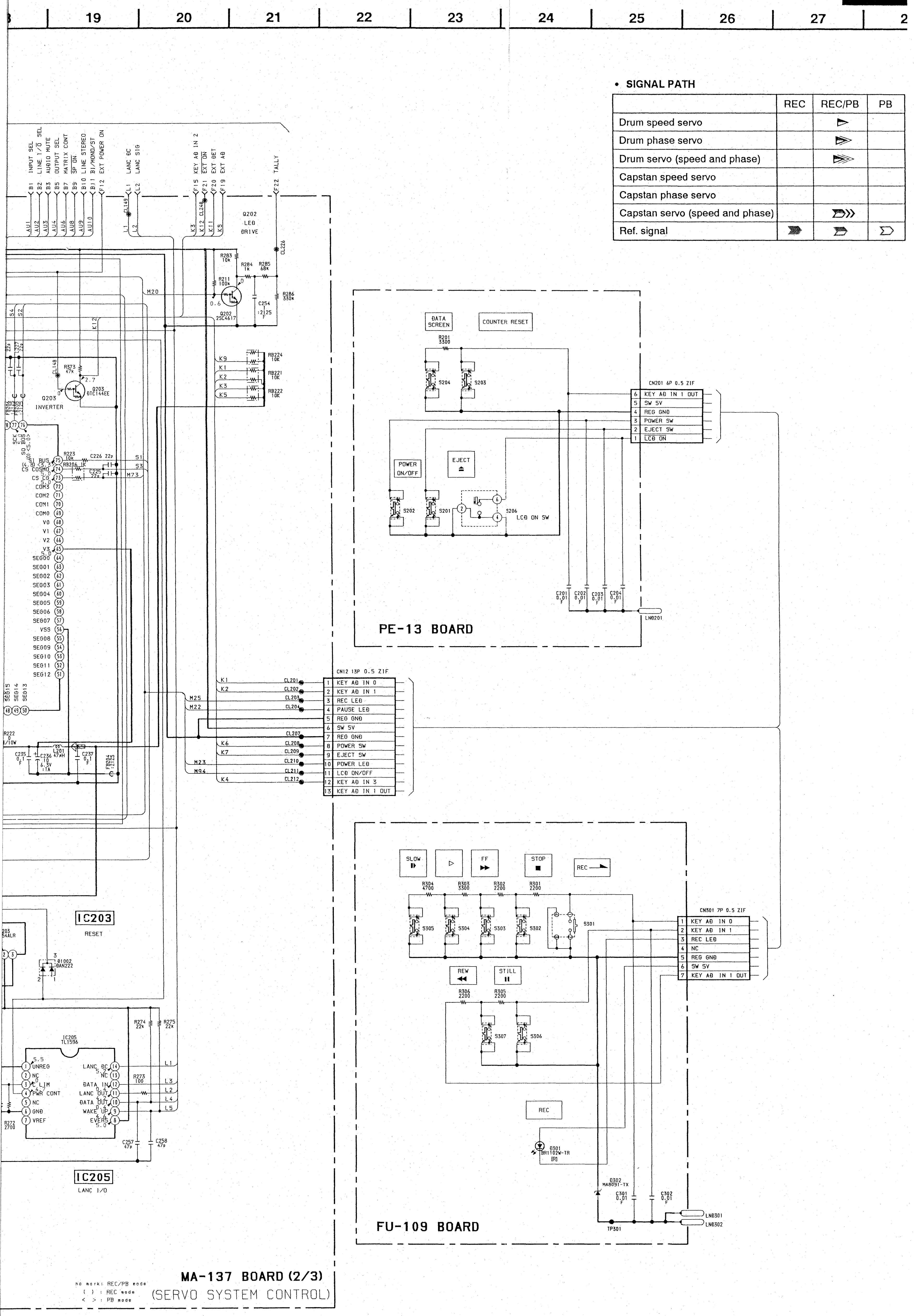
- Refer to page 79 for Printed Wiring Board. (MA-137 Board)


(See Page 98)

TO MA-137 BOARD (3/3)

no mark: REC/PB
( ) : REC mode
< > : PB mode

8
9
10
11
12
13
14
15
16
17
18
19
C11 CL146 F10 E DET
C23 CAP FG
E13 CL147 E13 D/A 1 TO 2
E7 MID TUNE 2CH
E6 MID TUNE 1CH
E4 HP VOL
E3 1.7M DEV
E2 1.5M DEV
E5 1.7M CAR
E1 1.5M CAR
C21 REC ATF
C22 PB RF
G1 LM UNREG
G2 LM UNGND
G3 SW 5V
G4 REG GND
G5 CAP VS
G6 CAP ERR
G7 CAP GND
G8 DRUM VS
G9 DRUM ERR
G10 DRUM GND
G11 SS UNREG
G12 SS GND
F1 D/A STB
F2 POWER ON
F4 CG CS
F5 BACK LIGHT ON
F6 POWER LED
F7 VIDEO CS
F8 VIDEO MUTE
F11 E MODE
F23 MONITOR ON
F13 SCK
F14 SO BUS
B1 INPUT SEL
B2 LINE I/O SEL
B3 AUDIO MUTE
B5 OUTPUT SEL
B7 MATRIX CONT
B9 SP ON
B10 LINE STEREO
B11 BI/MONO/ST
F12 EXT POWER ON
L1 CL149 L1 LANC DC
IC301
ATF SERVO
IC301 CXA1481R
IC201
MODE CONTROL
IC201 MB89092-109
IC206
EVR (D/A CONVERTER)
IC206 M62352GP
Q313 CAPSTAN ERROR AMP
Q313 FC149
IC202
SV REG
IC202 S-81350HG-KD
PS201 CCP2E10 (0.4A)
D1001 MA8091-TX
IC203
RESET
IC203 S-8054ALR
D1002 DAN222
Q203 DTC144EE
INVERTER
IC204
EE P ROM
IC204 AK6420F
IC205
LANC I/O
IC205 TL1596
IC103
DRUM MOTOR DRIVE
IC103 CXA8006M
Q310 2SC4617
Q310 DRUM ACC
D310 DAN222
X201 10MHz
X202 32KHz
S201
<SS-UNREG>
<SS-GND>
<DRUM-GND>
<LM-UNGND>
<SW5V>
<REG-GND>
<EVER5V>
CL128
CL205
CL213
CL221
CL246
CL301

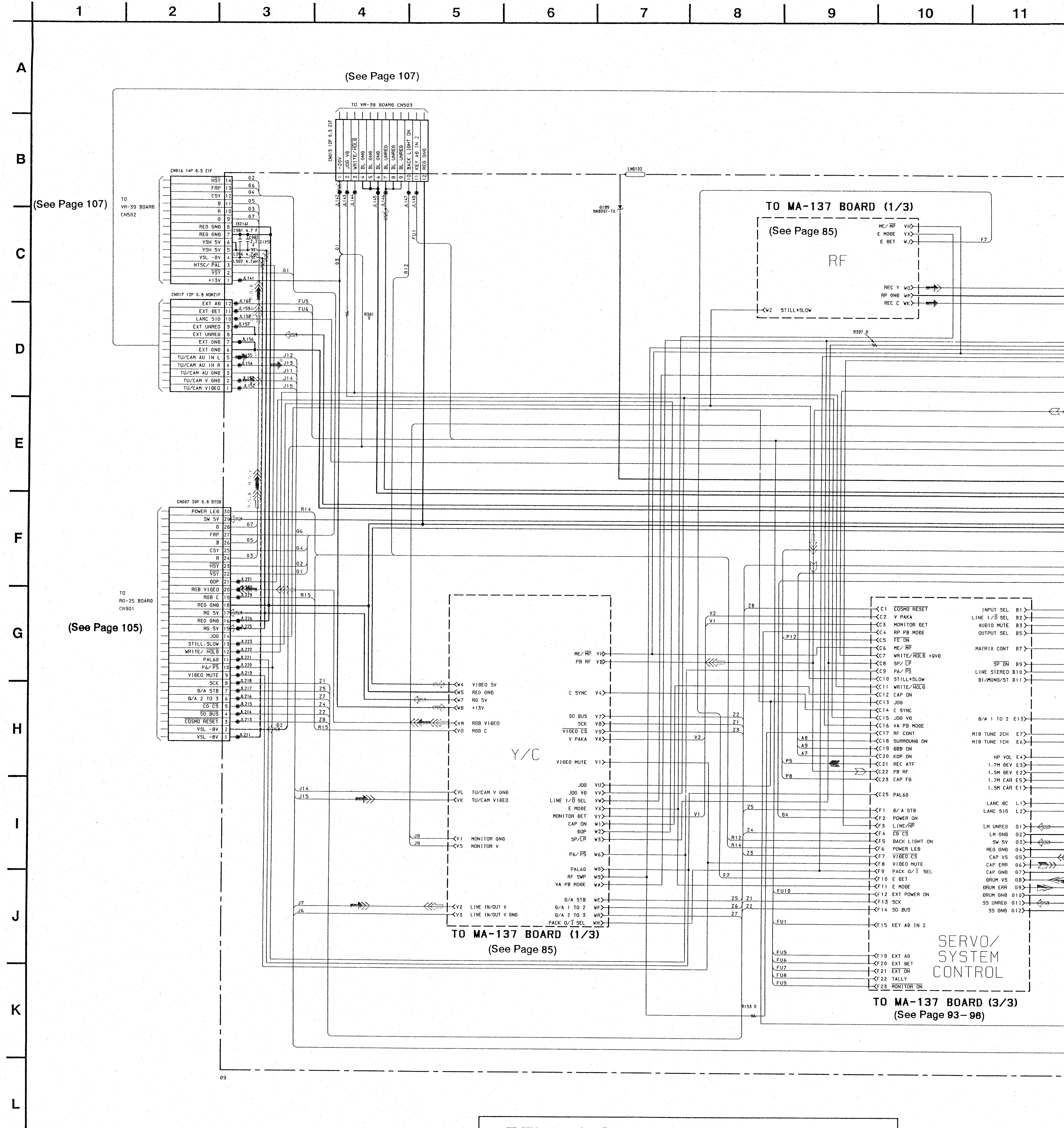

19
20
21
22
23
24
25
26
27
B1 INPUT SEL
B2 LINE I/O SEL
B3 AUDIO MUTE
B5 OUTPUT SEL
B7 MATRIX CONT
B9 SP ON
B10 LINE STEREO
B11 BI/MONO/ST
F12 EXT POWER ON
L1 LANC DC
L2 LANC SIG
F15 KEY AD IN 2
F21 EXT ON
F20 EXT DET
F19 EXT AD
F22 TALLY
Q202 LED DRIVE
Q203 INVERTER
IC203 RESET
IC205 LANC I/O
IC205 TL1596
CN12 13P 0.5 ZIF
1 KEY AD IN 0
2 KEY AD IN 1
3 REC LED
4 PAUSE LED
5 REG GND
6 SW 5V
7 REG GND
8 POWER SW
9 EJECT SW
10 POWER LED
11 LCD ON/OFF
12 KEY AD IN 3
13 KEY AD IN 1 OUT
PE-13 BOARD
DATA SCREEN
COUNTER RESET
POWER ON/OFF
EJECT
S206 LCD ON SW
CN201 6P 0.5 ZIF
6 KEY AD IN 1 OUT
5 SW 5V
4 REG GND
3 POWER SW
2 EJECT SW
1 LCD ON
FU-109 BOARD
SLOW
FF
STOP
REC
REW
STILL
CN301 7P 0.5 ZIF
1 KEY AD IN 0
2 KEY AD IN 1
3 REC LED
4 NC
5 REG GND
6 SW 5V
7 KEY AD IN 1 OUT
D301 BR1102W-TR
D302 MA8091-TX
TP301
LND301
LND302
MA-137 BOARD (2/3)
(SERVO SYSTEM CONTROL)
no mark: REC/PB mode
( ) : REC mode
< > : PB mode

- **SIGNAL PATH**

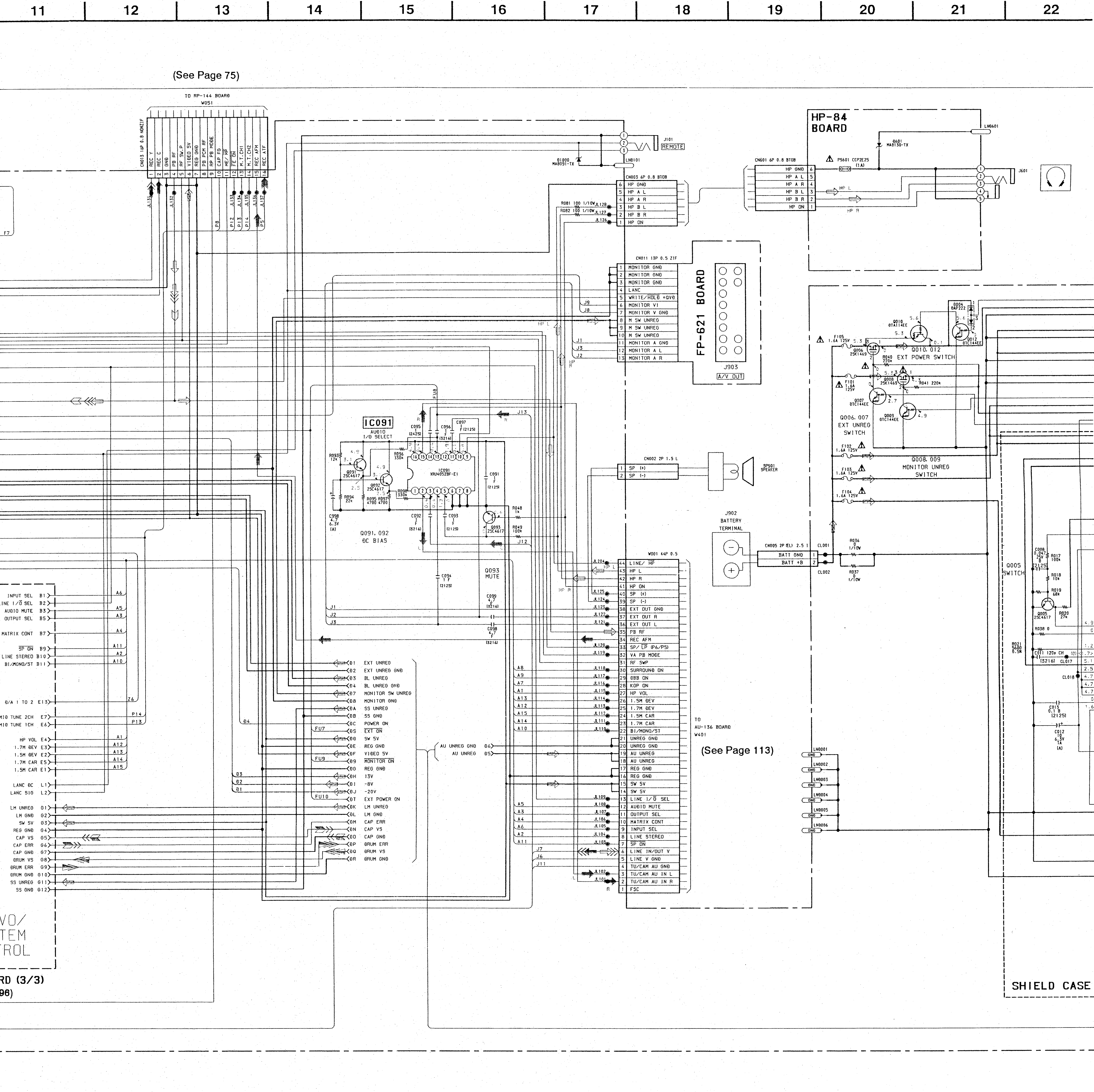
	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)		▷»	
Ref. signal	▶	▷	▷

MA-137 (RELAY/POWER), FP-621 (A/V OUTPUT JACK), HP-84 (HEADPHONE JACK), JK-86 (TUNER INPUT JACK) SCHEMATIC DIAGRAMS

- Refer to page 79 for Pri


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
J
K
L
(See Page 107)
TO VR-39 BOARD CN503
CN015 12P 0.5 ZIF
-20V
JOG V0
WRITE/HOLD
BL GND
BL GND
BL GND
BL UNREG
BL UNREG
BL UNREG
BACK LIGHT ON
KEY AD IN 2
REG GND
JL142
JL143
JL144
JL145
JL146
JL147
JL149
(See Page 107)
TO VR-39 BOARD CN502
CN016 14P 0.5 ZIF
HSY
FRP
CSY
B
R
G
REG GND
REG GND
VSH 5V
VSH 5V
VSL -8V
NTSC/ PAL
VSY
+13V
C981 4.7 F
C982 2.2 F
L906 4.7μH
L907 4.7μH
JL141
CN017 12P 0.8 NONZIF
EXT AD
EXT DET
LANC SIG
EXT UNREG
EXT UNREG
EXT GND
EXT GND
TU/CAM AU IN L
TU/CAM AU IN R
TU/CAM AU GND
TU/CAM V GND
TU/CAM VIDEO
R381 0
LN0102
D199 MA8091-TX
TO RG-25 BOARD CN901
(See Page 105)
CN007 30P 0.8 BTOB
POWER LED
SW 5V
G
FRP
B
CSY
R
HSY
VSY
DOP
RGB VIDEO
RGB C
REG GND
RG 5V
REG GND
RG 5V
JOG
STILL.SLOW
WRITE/ HOLD
PAL60
P6/ P5
VIDEO MUTE
SCK
D/A STB
D/A 2 TO 3
CG CS
SO BUS
COSMO RESET
VSL -8V
VSL -8V
TO MA-137 BOARD (1/3)
(See Page 85)
RF
ME/ MP VH
E MODE VX
E DET WJ
REC Y WO
RP GND WP
REC C WK
WZ STILL*SLOW
R397 0
Y/C
W4 VIDEO 5V
W5 REG GND
W7 RG 5V
WB +13V
VM RGB VIDEO
VO RGB C
VL TU/CAM V GND
VK TU/CAM VIDEO
V1 MONITOR GND
V5 MONITOR V
V2 LINE IN/OUT V
V3 LINE IN/OUT V GND
ME/ MP VH
PB RF VB
C SYNC V4
SO BUS V7
SCK V8
VIDEO CS V9
V PAKA VA
VIDEO MUTE V1
JOG VU
JOG V0 VV
LINE I/O SEL VW
E MODE VX
MONITOR DET VY
CAP ON W1
DOP W2
SP/LP W3
P6/ P5 W6
PAL60 W8
RF SWP W9
VA PB MODE WA
D/A STB WE
D/A 1 TO 2 WF
D/A 2 TO 3 WR
PACK O/I SEL WH
TO MA-137 BOARD (1/3)
(See Page 85)
SERVO/ SYSTEM CONTROL
C1 COSMO RESET
C2 V PAKA
C3 MONITOR DET
C4 RP PB MODE
C5 FE ON
C6 ME/ MP
C7 WRITE/HOLD +QVD
C8 SP/ LP
C9 P6/ P5
C10 STILL*SLOW
C11 WRITE/HOLD
C12 CAP ON
C13 JOG
C14 C SYNC
C15 JOG V0
C16 VA PB MODE
C17 RF CONT
C18 SURROUND ON
C19 DBB ON
C20 KOP ON
C21 REC ATF
C22 PB RF
C23 CAP FG
C25 PAL60
F1 D/ A STB
F2 POWER ON
F3 LINE/HP
F4 CG CS
F5 BACK LIGHT ON
F6 POWER LED
F7 VIDEO CS
F8 VIDEO MUTE
F9 PACK O/I SEL
F10 E DET
F11 E MODE
F12 EXT POWER ON
F13 SCK
F14 SO BUS
F15 KEY AD IN 2
F19 EXT AD
F20 EXT DET
F21 EXT ON
F22 TALLY
F23 MONITOR ON
INPUT SEL B1
LINE I/O SEL B2
AUDIO MUTE B3
OUTPUT SEL B5
MATRIX CONT B7
SP ON B9
LINE STEREO B10
BI/MONO/ST B11
D/A 1 TO 2 E13
MID TUNE 2CH E7
MID TUNE 1CH E6
HP VOL E4
1.7M DEV E3
1.5M DEV E2
1.7M CAR E5
1.5M CAR E1
LANC DC L1
LANC SIG L2
LM UNREG G1
LM GND G2
SW 5V G3
REG GND G4
CAP VS G5
CAP ERR G6
CAP GND G7
DRUM VS G8
DRUM ERR G9
DRUM GND G10
SS UNREG G11
SS GND G12
TO MA-137 BOARD (3/3)
(See Page 93-96)
R153 0

to page 79 for Printed Wiring Board. (MA-137 Board)



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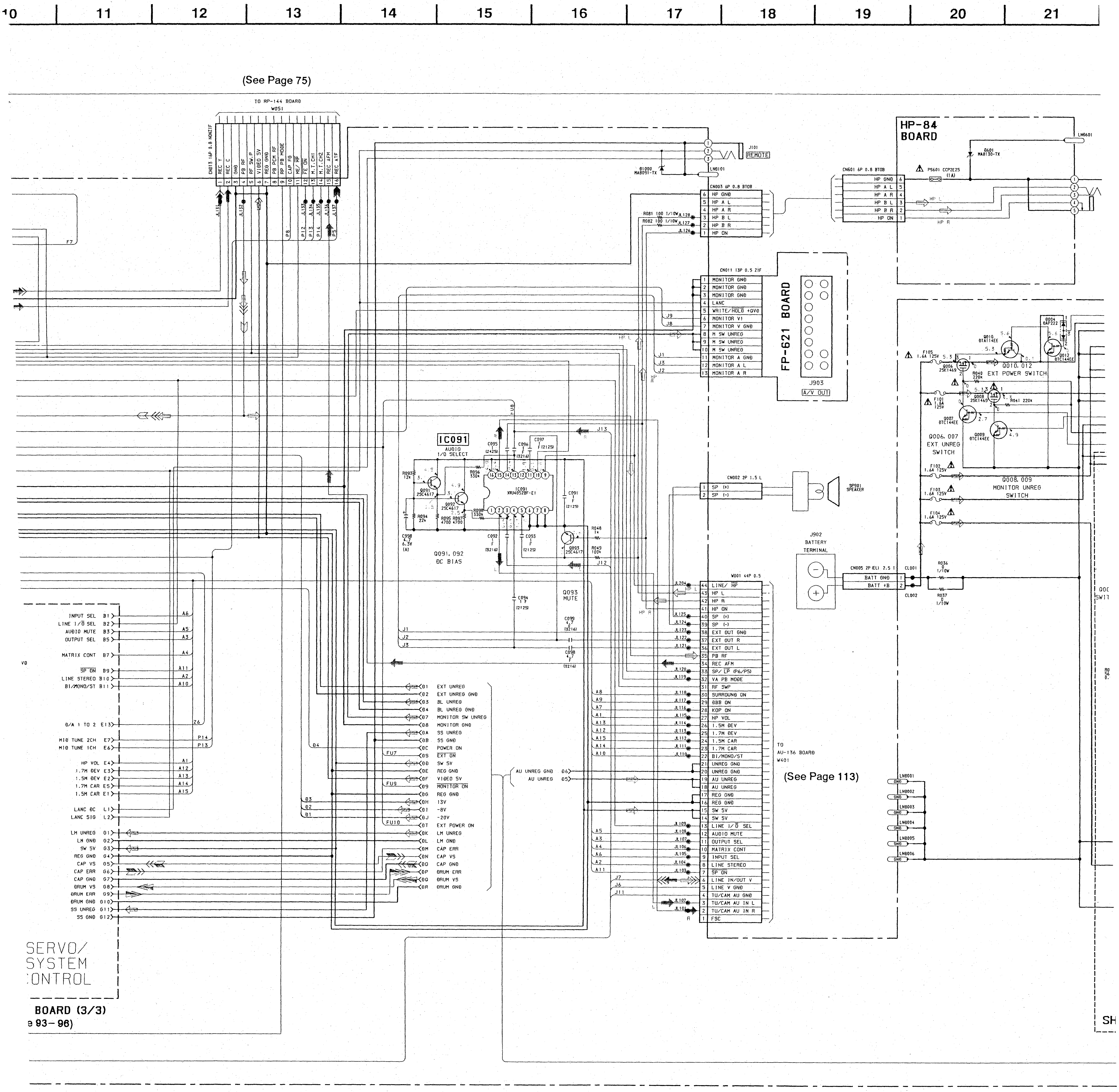
16
17
18
19
20
21
22
(See Page 75)
TO RP-144 BOARD
W051
CN013 16P 0.8 NONZIF
1 REC Y
2 REC C
3 GND
4 PB RF
5 RF SW.P
6 VIDEO 5V
7 REG GND
8 PB PCM RF
9 RP PB MODE
10 CAP FG
11 HE/HP
12 FE ON
13 M.T.CH1
14 M.T.CH2
15 REC AFM
16 REC ATF
J101
REMOTE
D1000 MA8091-TX
LN0101
CN003 6P 0.8 BTOB
6 HP GND
5 HP A L
4 HP A R
3 HP B L
2 HP B R
1 HP ON
HP-84 BOARD
PS601 CCP2E25 (1A)
D601 MA8130-TX
CN601 6P 0.8 BTOB
J601
LN0601
CN011 13P 0.5 ZIF
1 MONITOR GND
2 MONITOR GND
3 MONITOR GND
4 LANC
5 WRITE/HOLD +QV0
6 MONITOR V1
7 MONITOR V GND
8 M SW UNREG
9 M SW UNREG
10 M SW UNREG
11 MONITOR A GND
12 MONITOR A L
13 MONITOR A R
FP-621 BOARD
J903
A/V OUT
IC091
AUDIO I/O SELECT
IC091 XRU4052BF-E1
Q091, 092
DC BIAS
Q093
MUTE
CN002 2P 1.5 L
1 SP (+)
2 SP (-)
SP901 SPEAKER
J902 BATTERY TERMINAL
CN005 2P (EL) 2.5 1
BATT GND
BATT +B
CL001
CL002
W001 44P 0.5
44 LINE/HP
43 HP L
42 HP R
41 HP ON
40 SP (+)
39 SP (-)
38 EXT OUT GND
37 EXT OUT R
36 EXT OUT L
35 PB RF
34 REC AFM
33 SP/LP (P6/P5)
32 VA PB MODE
31 RF SWP
30 SURROUND ON
29 DBB ON
28 KDP ON
27 HP VOL
26 1.5M DEV
25 1.7M DEV
24 1.5M CAR
23 1.7M CAR
22 BI/MONO/ST
21 UNREG GND
20 UNREG GND
19 AU UNREG
18 AU UNREG
17 REG GND
16 REG GND
15 SW 5V
14 SW 5V
13 LINE I/O SEL
12 AUDIO MUTE
11 OUTPUT SEL
10 MATRIX CONT
9 INPUT SEL
8 LINE STEREO
7 SP ON
6 LINE IN/OUT V
5 LINE V GND
4 TU/CAM AU GND
3 TU/CAM AU IN L
2 TU/CAM AU IN R
1 FSC
TO AU-136 BOARD W401
(See Page 113)
EXT UNREG
EXT UNREG GND
BL UNREG
BL UNREG GND
MONITOR SW UNREG
MONITOR GND
SS UNREG
SS GND
POWER ON
EXT ON
SW 5V
REG GND
VIDEO 5V
MONITOR ON
REG GND
13V
-8V
-20V
EXT POWER ON
LM UNREG
LM GND
CAP ERR
CAP VS
CAP GND
DRUM ERR
DRUM VS
DRUM GND
AU UNREG GND
AU UNREG
INPUT SEL B1
LINE I/O SEL B2
AUDIO MUTE B3
OUTPUT SEL B5
MATRIX CONT B7
SP ON B9
LINE STEREO B10
BI/MONO/ST B11
D/A 1 TO 2 E13
HI0 TUNE 2CH E7
HI0 TUNE 1CH E6
HP VOL E4
1.7M DEV E3
1.5M DEV E2
1.7M CAR E5
1.5M CAR E1
LANC DC L1
LANC SIG L2
LM UNREG G1
LM GND G2
SW 5V G3
REG GND G4
CAP VS G5
CAP ERR G6
CAP GND G7
DRUM VS G8
DRUM ERR G9
DRUM GND G10
SS UNREG G11
SS GND G12
VO/
TEM
ROL
RD (3/3)
96)
Q010, 012
EXT POWER SWITCH
Q006, 007
EXT UNREG SWITCH
Q008, 009
MONITOR UNREG SWITCH
F105 1.6A 125V
F101 1.6A 125V
F102 1.6A 125V
F103 1.6A 125V
F104 1.6A 125V
LN0001
LN0002
LN0003
LN0004
LN0005
LN0006
Q005 SWITCH
SHIELD CASE

• Refer to page 79 for Printed Wiring Board. (MA-137 Board)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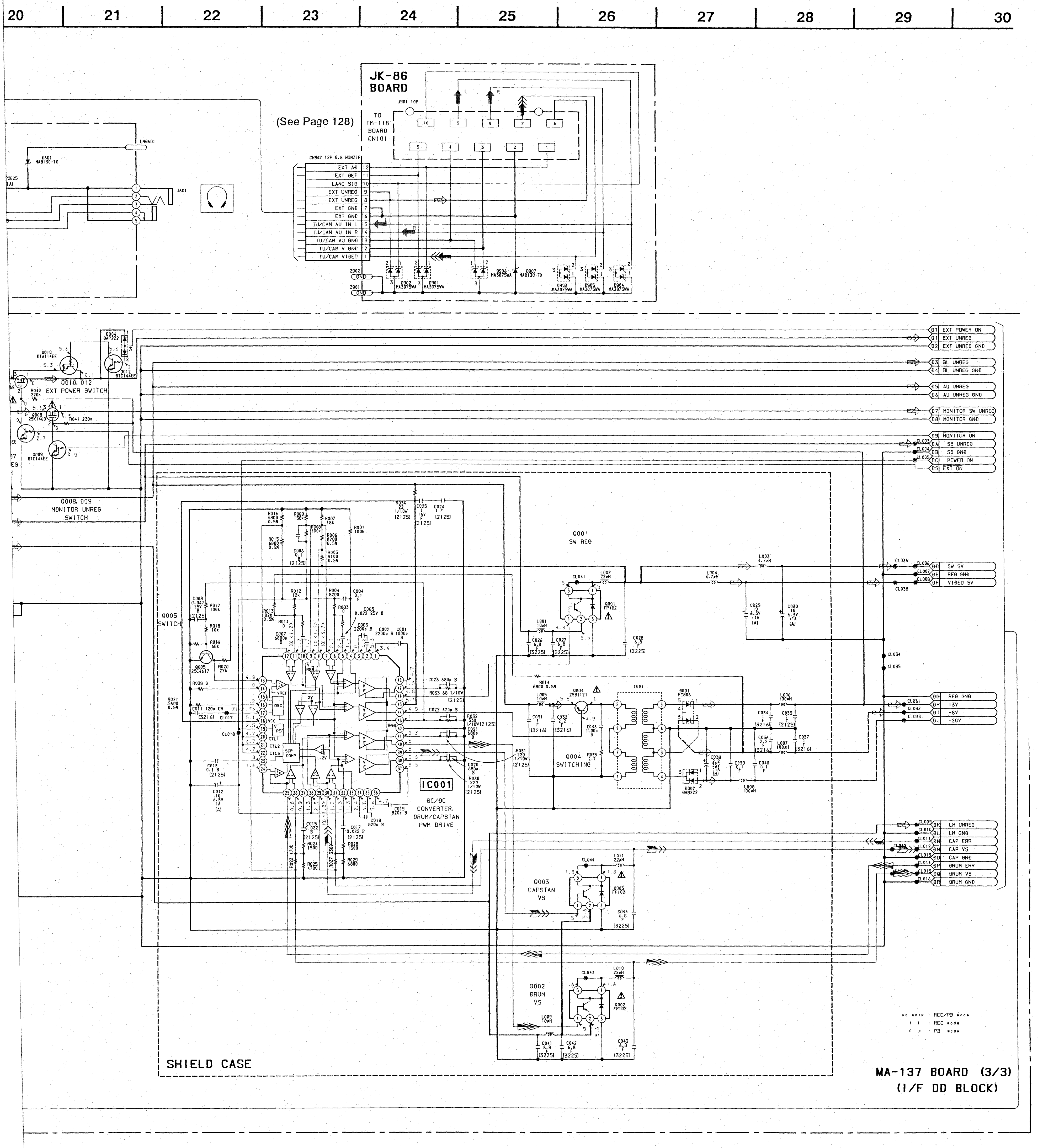
15
16
17
18
19
20
21
(See Page 75)
TO RP-144 BOARD W051
CN013 16P 0.8 NONZIF
REC Y
REC C
GND
PB RF
RF SW.P
VIDEO 5V
REG GND
PB PCM RF
RP PB MODE
CAP FG
ME/ MP
FE ON
M.T.CH1
M.T.CH2
REC AFM
REC ATF
J101 REMOTE
D1000 MA8091-TX
LN0101
CN003 6P 0.8 BTOB
HP GND
HP A L
HP A R
HP B L
HP B R
HP ON
CN601 6P 0.8 BTOB
HP-84 BOARD
D601 MA8130-TX
PS601 CCP2E25 (1A)
LN0601
CN011 13P 0.5 ZIF
MONITOR GND
LANC
WRITE/HOLD +GVO
MONITOR V1
MONITOR V GND
M SW UNREG
MONITOR A GND
MONITOR A L
MONITOR A R
FP-621 BOARD
J903 A/V OUT
IC091 AUDIO I/O SELECT
IC091 XRU4052BF-E1
Q091, 092 DC BIAS
Q093 MUTE
CN002 2P 1.5 L
SP (+)
SP (-)
SP001 SPEAKER
J902 BATTERY TERMINAL
CN005 2P (EL) 2.5 L
BATT GND
BATT +B
Q010, 012 EXT POWER SWITCH
Q006, 007 EXT UNREG SWITCH
Q008, 009 MONITOR UNREG SWITCH
F101 1.6A 125V
F102 1.6A 125V
F103 1.6A 125V
F104 1.6A 125V
F105 1.6A 125V
W001 44P 0.5
LINE/ HP
HP L
HP R
HP ON
EXT OUT GND
EXT OUT R
EXT OUT L
PB RF
REC AFM
SP/ LP (P6/P5)
VA PB MODE
RF SWP
SURROUND ON
BBB ON
KOP ON
HP VOL
1.5M DEV
1.7M DEV
1.5M CAR
1.7M CAR
BI/MONO/ST
UNREG GND
UNREG GND
AU UNREG
AU UNREG
REG GND
REG GND
SW 5V
SW 5V
LINE I/O SEL
AUDIO MUTE
OUTPUT SEL
MATRIX CONT
INPUT SEL
LINE STEREO
SP ON
LINE IN/OUT V
LINE V GND
TU/CAM AU GND
TU/CAM AU IN L
TU/CAM AU IN R
FSC
TO AU-136 BOARD W401
(See Page 113)
INPUT SEL B1
LINE I/O SEL B2
AUDIO MUTE B3
OUTPUT SEL B5
MATRIX CONT B7
SP ON B9
LINE STEREO B10
BI/MONO/ST B11
D/A 1 TO 2 E13
MID TUNE 2CH E7
MID TUNE 1CH E6
HP VOL E4
1.7M DEV E3
1.5M DEV E2
1.7M CAR E5
1.5M CAR E1
LANC DC L1
LANC SIG L2
LM UNREG G1
LM GND G2
SW 5V G3
REG GND G4
CAP VS G5
CAP ERR G6
CAP GND G7
DRUM VS G8
DRUM ERR G9
DRUM GND G10
SS UNREG G11
SS GND G12
EXT UNREG
EXT UNREG GND
BL UNREG
BL UNREG GND
MONITOR SW UNREG
MONITOR GND
SS UNREG
SS GND
POWER ON
EXT ON
SW 5V
REG GND
VIDEO 5V
MONITOR ON
REG GND
13V
-8V
-20V
EXT POWER ON
LM UNREG
LM GND
CAP ERR
CAP VS
CAP GND
DRUM ERR
DRUM VS
DRUM GND
AU UNREG GND
AU UNREG
SERVO/ SYSTEM CONTROL
BOARD (3/3)
93-96)

RELA

- SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➾	➡»	➡
PB			⇨»	⇨

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)		▷»	
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)		➣»	
Ref. signal	➤		▷



20
21
22
23
24
25
26
27
28
29
30
JK-86 BOARD
(See Page 128)
TO TM-118 BOARD CN101
J901 10P
CN902 12P 0.8 NONZIF
EXT AD 12
EXT DET 11
LANC SIG 10
EXT UNREG 9
EXT UNREG 8
EXT GND 7
EXT GND 6
TU/CAM AU IN L 5
TU/CAM AU IN R 4
TU/CAM AU GND 3
TU/CAM V GND 2
TU/CAM VIDEO 1
Z902 GND
Z901 GND
D902 MA3075WA
D901 MA3075WA
D906 MA3075WA
D907 MA8130-TX
D903 MA3075WA
D905 MA3075WA
D904 MA3075WA
LN6601
D601 MA8130-TX
J601
Q010, 012 EXT POWER SWITCH
Q008, 009 MONITOR UNREG SWITCH
Q005 SWITCH
Q001 SW REG
Q004 SWITCHING
Q003 CAPSTAN VS
Q002 DRUM VS
T001
IC001
DC/DC CONVERTER, DRUM/CAPSTAN PWM DRIVE
SHIELD CASE
D7 EXT POWER ON
D1 EXT UNREG
D2 EXT UNREG GND
D3 BL UNREG
D4 BL UNREG GND
D5 AU UNREG
D6 AU UNREG GND
D7 MONITOR SW UNREG
D8 MONITOR GND
D9 MONITOR ON
DA SS UNREG
DB SS GND
DC POWER ON
DS EXT ON
DD SW 5V
DE REG GND
DF VIDEO 5V
DG REG GND
DH 13V
DI -8V
DJ -20V
DK LM UNREG
DL LM GND
DM CAP ERR
DN CAP VS
DO CAP GND
DP DRUM ERR
DQ DRUM VS
DR DRUM GND

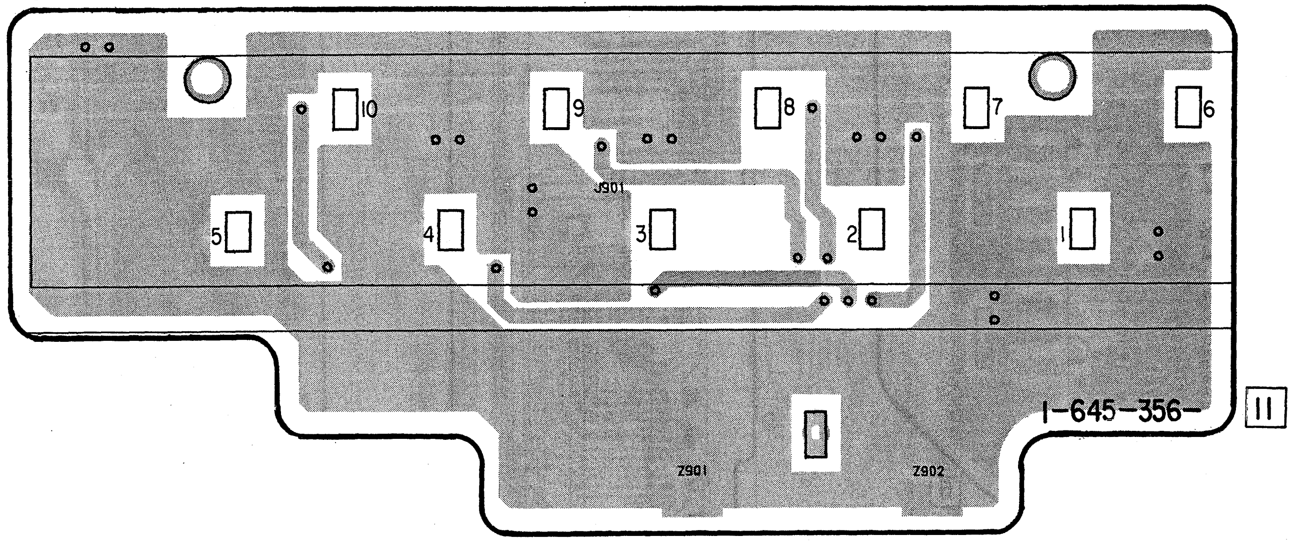
no mark : REC/PB mode
( ) : REC mode
< > : PB mode

MA-137 BOARD (3/3)
(I/F DD BLOCK)

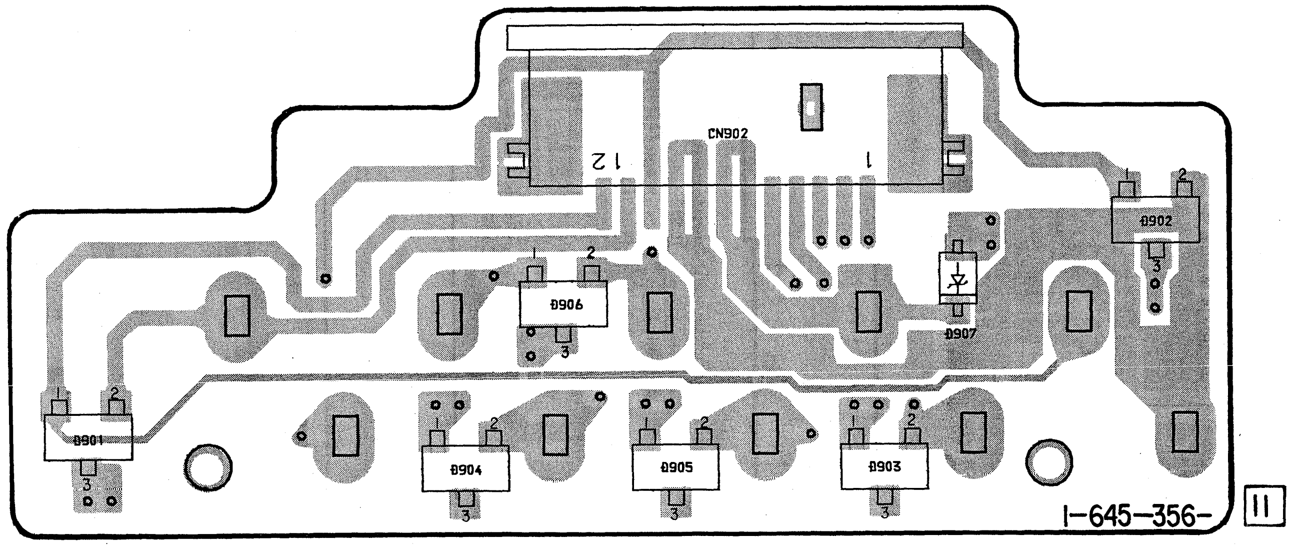
FP-621 (A/V OUTPUT JACK), HP-84 (HEADPHONE JACK), JK-86 (TUNER INPUT JACK) PRINTED WIRING BOARDS

- FP-621 board is replaced as blocks, so that there PRINTED WIRING BOARDS are omitted.

JK-86 BOARD (COMPONENT SIDE)


10
9
8
7
6
5
4
3
2
1
J901
Z901
Z902
1-645-356-
11

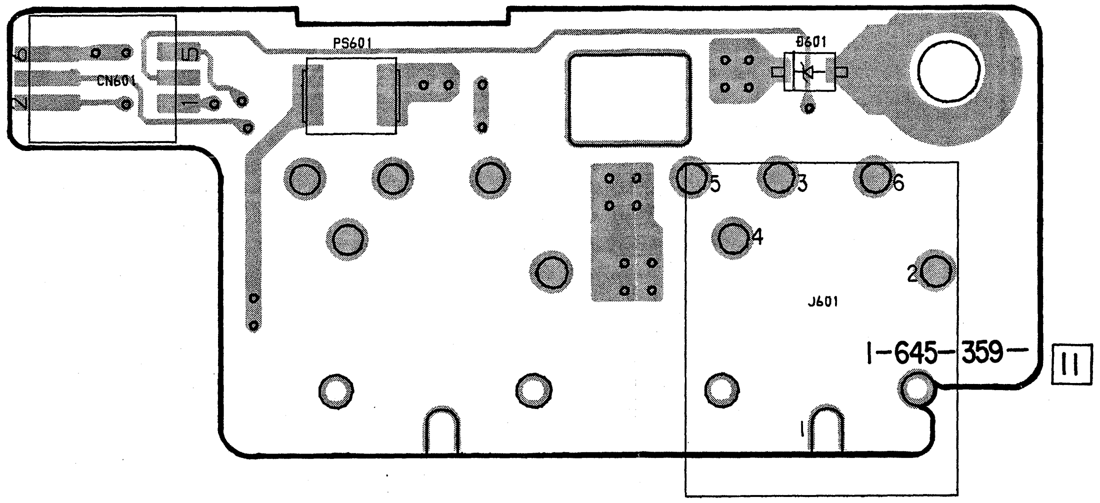
JK-86 BOARD (CONDUCTOR SIDE)


CN902
1 2
1
D901
D902
D903
D904
D905
D906
D907
1-645-356-
11

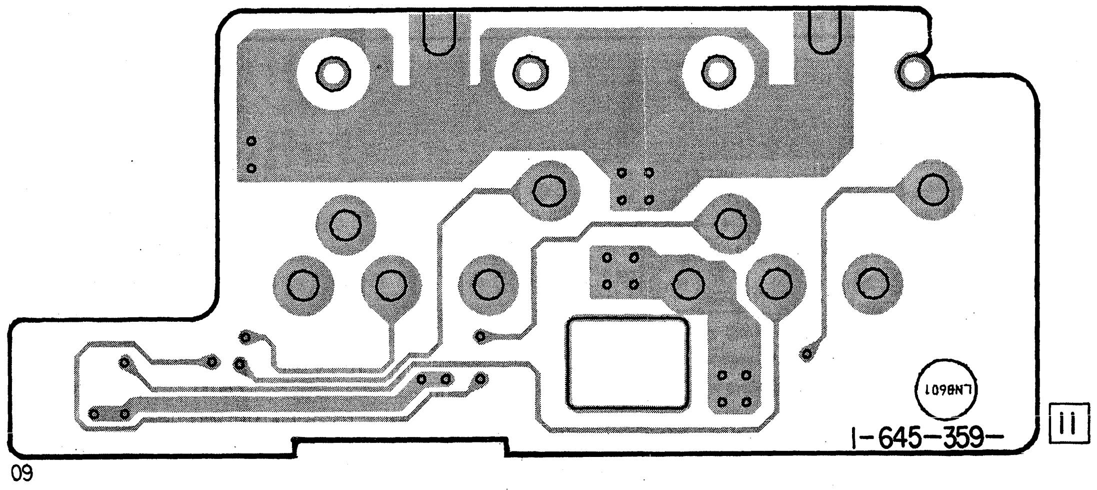
(DIODE)

D901	8-719-420-81	DIODE MA3075WA
D902	8-719-420-81	DIODE MA3075WA
D903	8-719-420-81	DIODE MA3075WA
D904	8-719-420-81	DIODE MA3075WA
D905	8-719-420-81	DIODE MA3075WA
D906	8-719-420-81	DIODE MA3075WA
D907	8-719-420-87	DIODE MA8130

HP-84 BOARD (COMPONENT SIDE)


PS601
D601
CN601
J601
5
3
6
4
2
1
1-645-359-
11

HP-84 BOARD (CONDUCTOR SIDE)


CN601
1-645-359-
11
09

(DIODE)

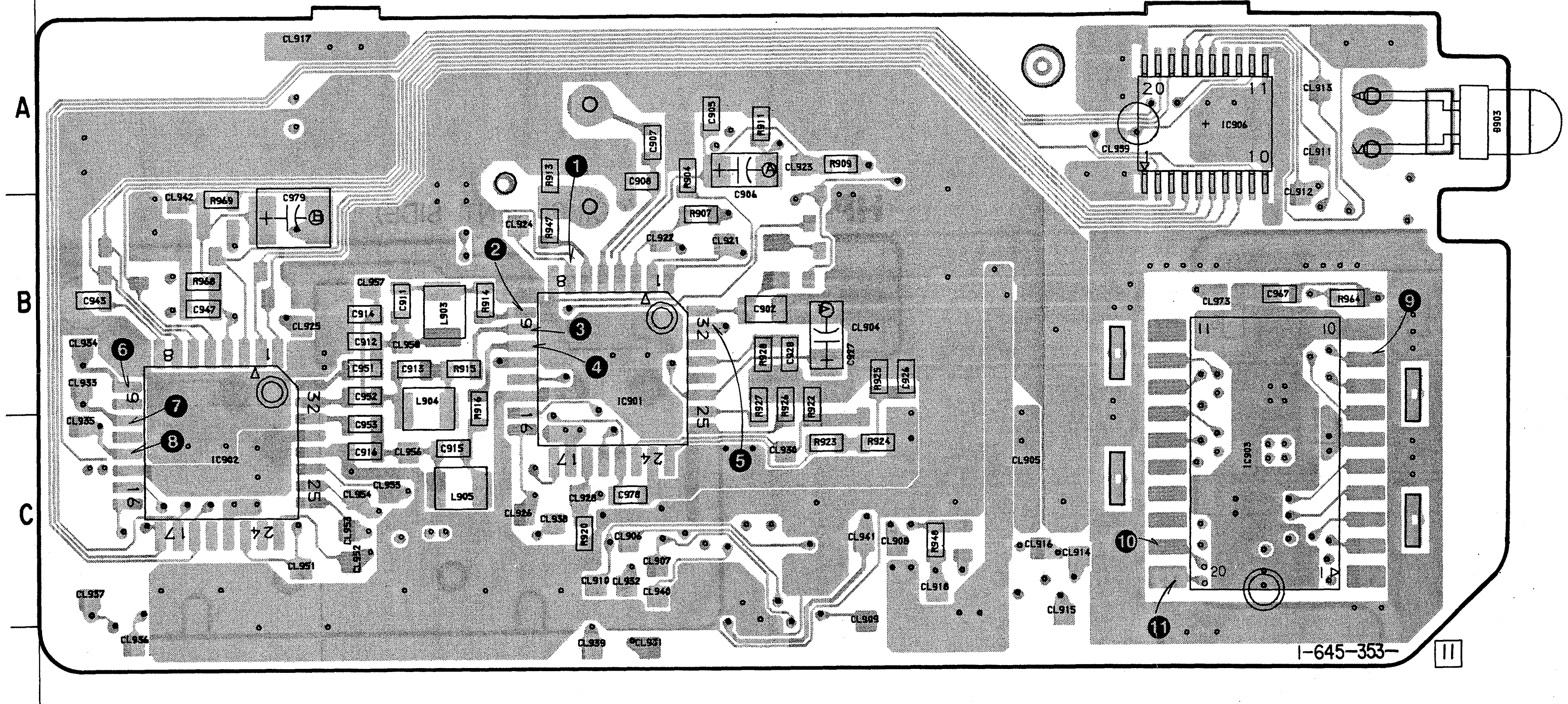
D601 · 8-719-420-87 DIODE MA8130

RG-25 (LCD VIDEO), VR-39 (FUNCTION SWITCH), LA-22 (BACK LIGHT RELAY), LA-23 (BACK LIGHT RELAY) PRINTED WIRING BOARDS

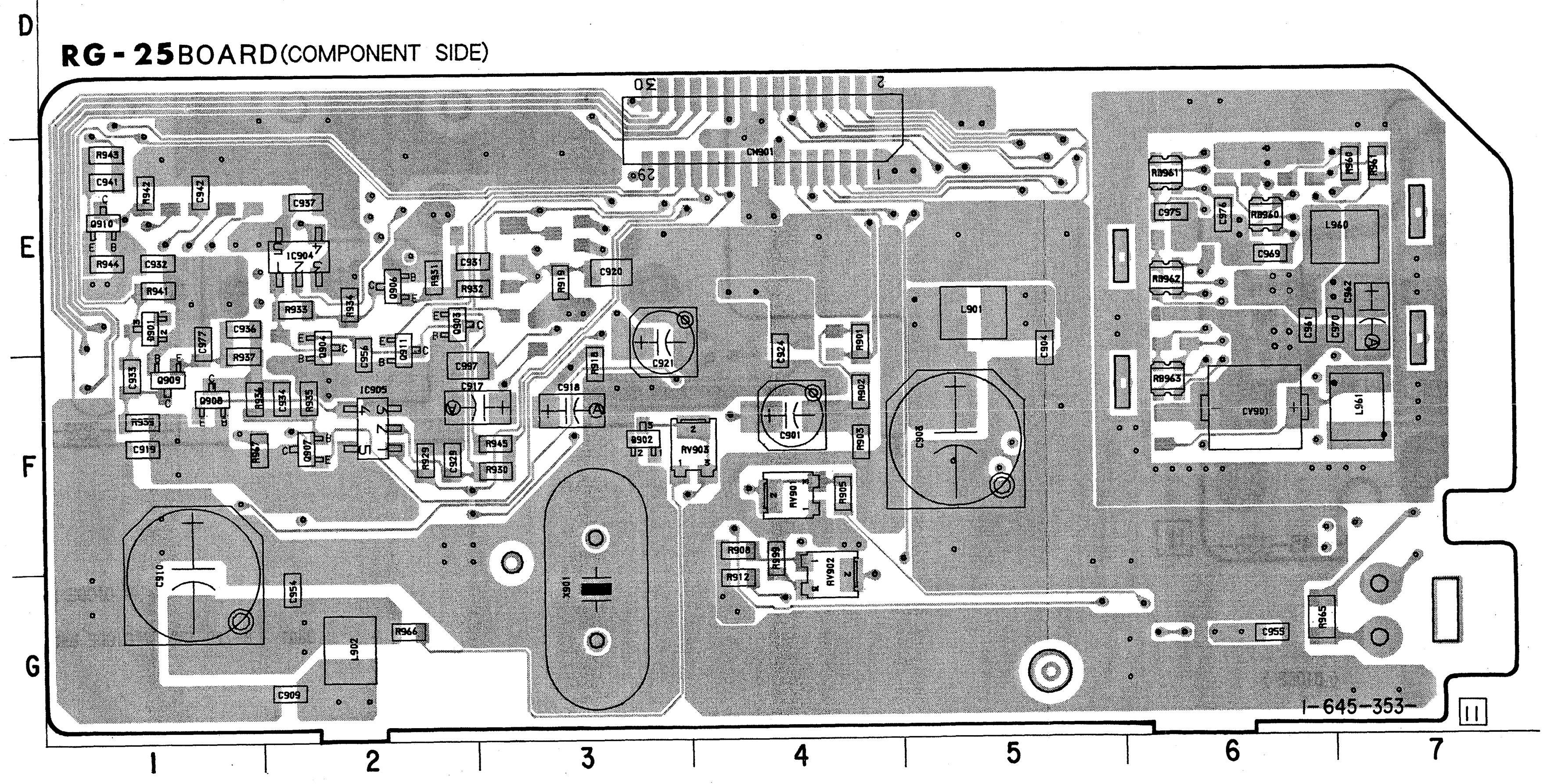
RG-25 BOARD

D901	E-1
D902	F-3
D903	A-7
IC901	B-3
IC902	C-1
IC903	C-6
IC904	E-2
IC905	F-2
IC906	A-6
Q903	E-2
Q904	E-2
Q906	E-2
Q907	F-2
Q908	F-1
Q909	F-1
Q910	E-1
Q911	E-2

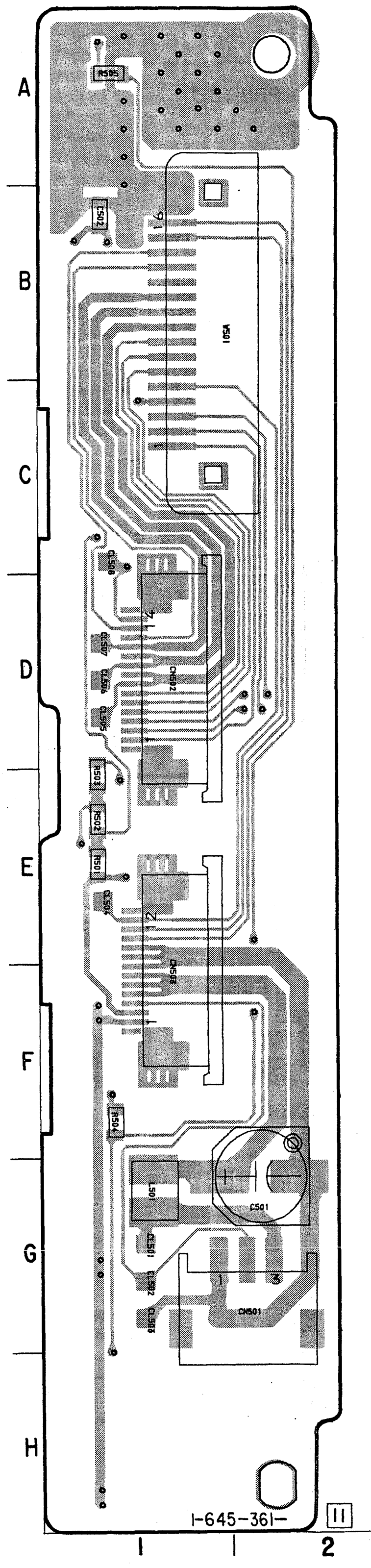
RG-25 BOARD (CONDUCTOR SIDE)


A
B
C
IC901
IC902
IC903
IC906
D903
1-645-353-
11

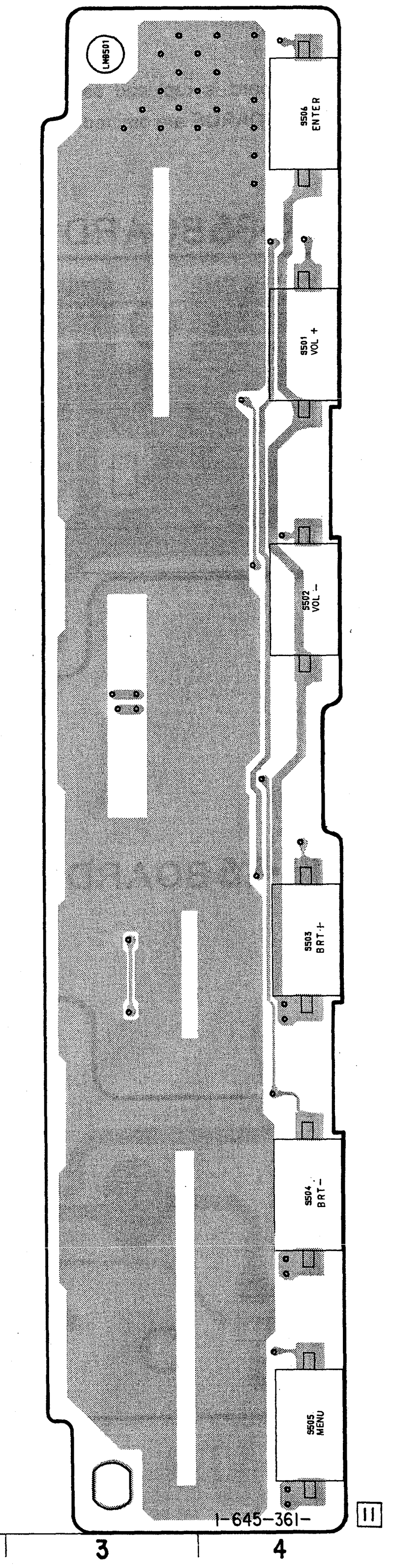
RG-25 BOARD (COMPONENT SIDE)


D
E
F
G
CN901
IC904
IC905
L901
X901
1-645-353-
11
1
2
3
4
5
6
7

VR-39 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
H
CN501
C501
1-645-361-
11
1
2

VR-39 BOARD (CONDUCTOR SIDE)


S506 ENTER
S501 VOL +
S502 VOL -
S503 BRT +
S504 BRT -
S505 MENU
1-645-361-
11
3
4

〈 DIODE 〉

D901	8-719-989-03	DIODE	DAN222
D902	8-719-989-03	DIODE	DAN222
D903	8-719-938-67	LED	GL-3EG8

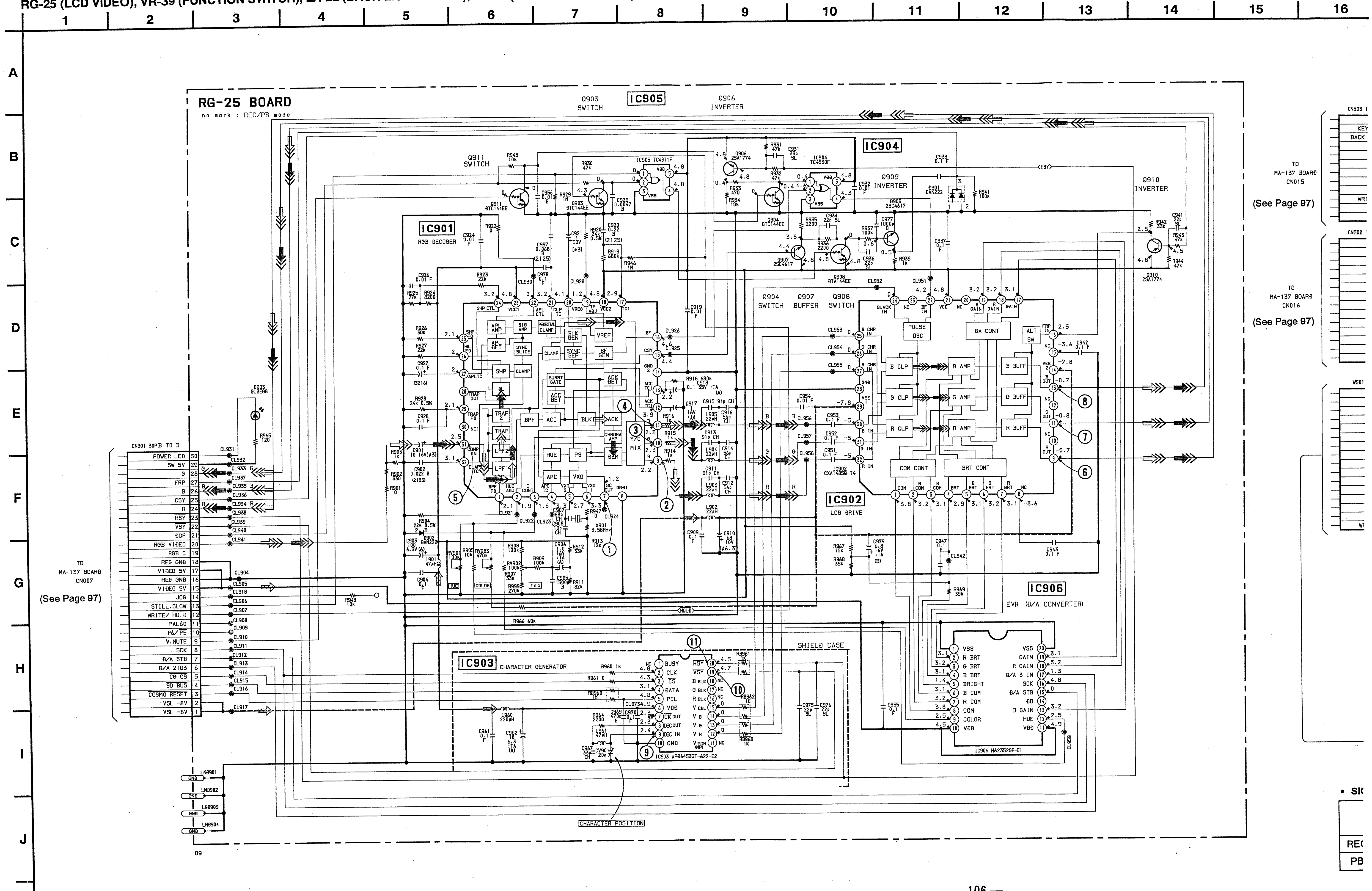
〈 IC 〉

IC901	8-752-056-40	IC	CXA1385Q
IC902	8-752-057-28	IC	CXA1485Q
IC903	8-759-084-06	IC	uPD6453GT-622-E2
IC904	8-759-234-13	IC	TC4S30F
IC905	8-759-209-69	IC	TC4S11F
IC906	8-759-635-27	IC	M62352GP

〈 TRANSISTOR 〉

Q903	8-729-928-81	TRANSISTOR	DTC144EE
Q904	8-729-928-81	TRANSISTOR	DTC144EE
Q906	8-729-928-19	TRANSISTOR	2SA1774R
Q907	8-729-927-XX	TRANSISTOR	2SC4617R
Q908	8-729-928-27	TRANSISTOR	DTA144EE
Q909	8-729-927-XX	TRANSISTOR	2SC4617R
Q910	8-729-928-19	TRANSISTOR	2SA1774R
Q911	8-729-928-81	TRANSISTOR	DTC144EE

RG-25 (LCD VIDEO), VR-39 (FUNCTION SWITCH), LA-22 (BACK LIGHT RELAY), LA-23 (BACK LIGHT RELAY) SCHEMATIC DIAGRAMS



1
2
3
4
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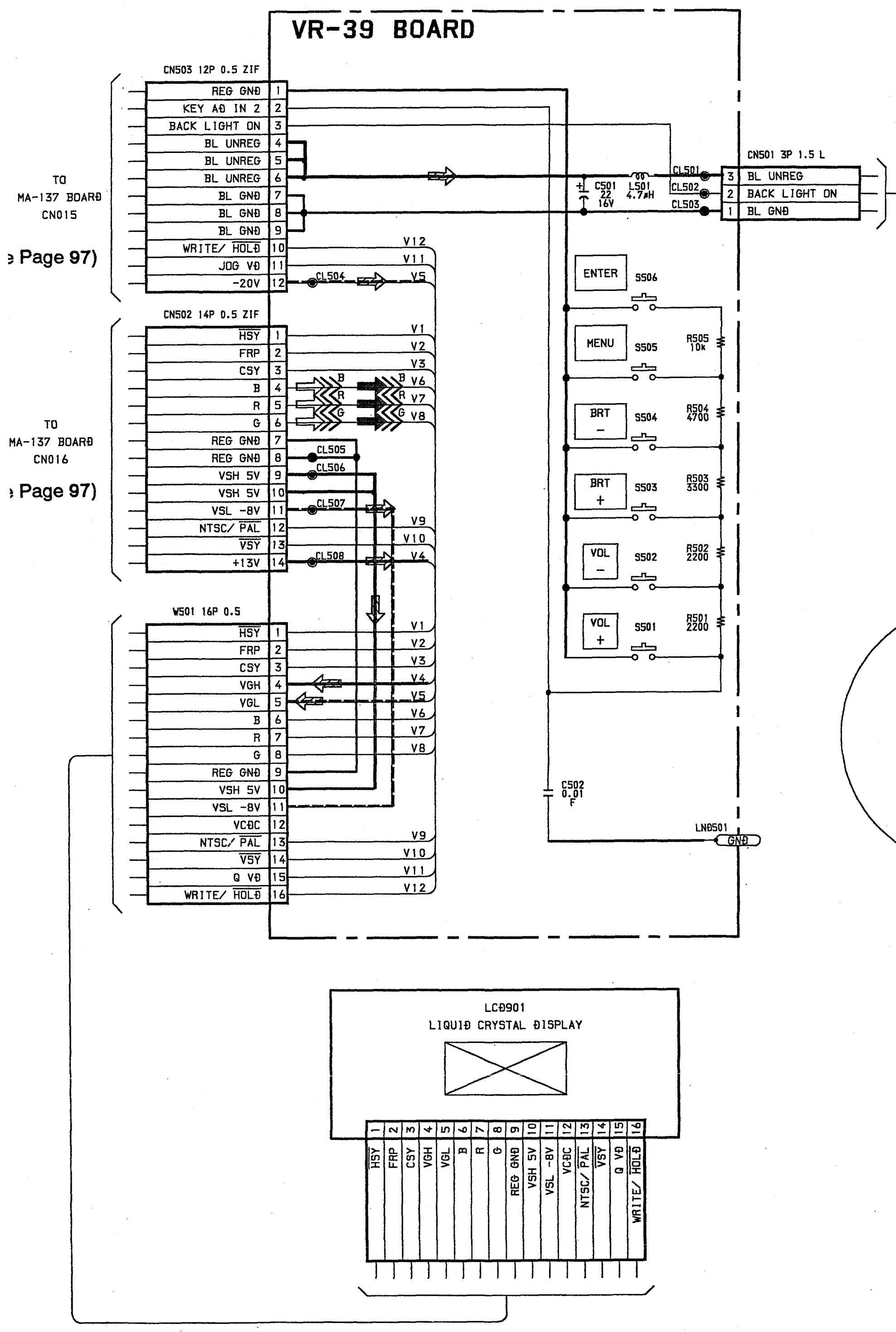
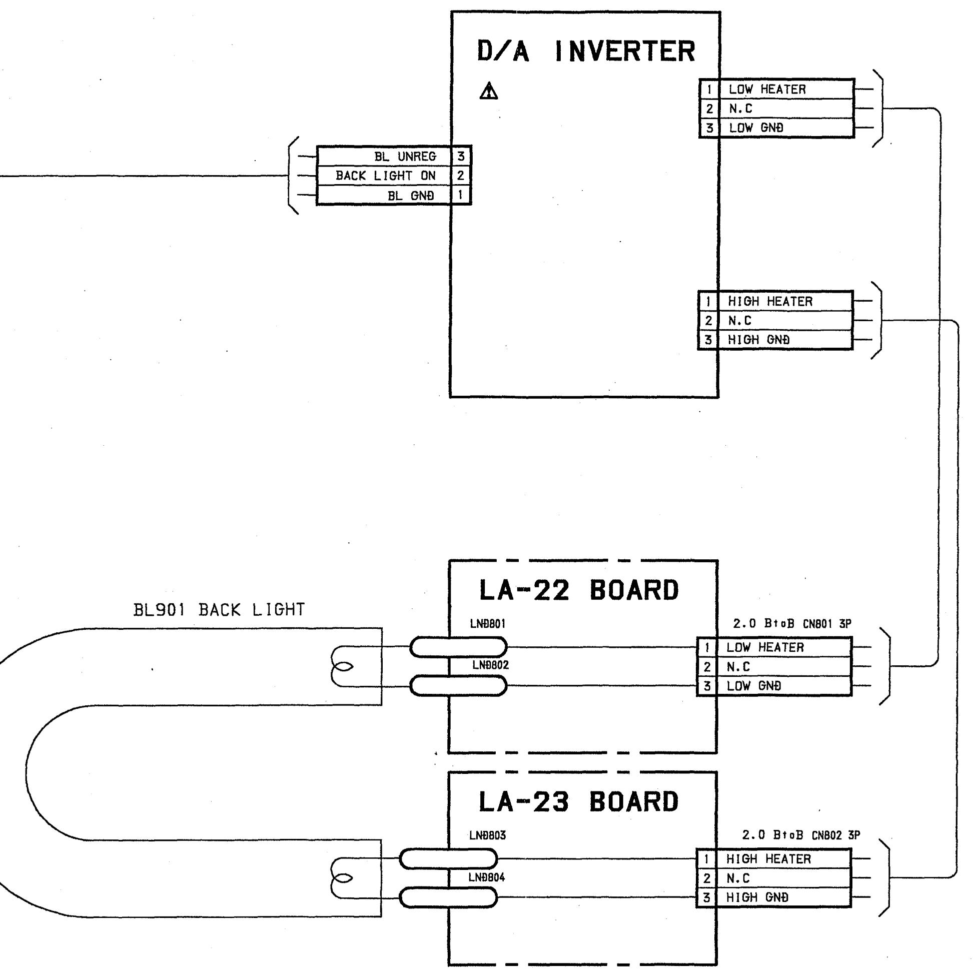
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
RG-25 BOARD
no mark : REC/PB mode
Q903 SWITCH
IC905
Q906 INVERTER
IC904
Q909 INVERTER
Q910 INVERTER
Q911 SWITCH
IC901
RGB DECODER
Q904 SWITCH
Q907 BUFFER
Q908 SWITCH
IC902
LCD DRIVE
IC903
CHARACTER GENERATOR
IC906
EVR (D/A CONVERTER)
SHIELD CASE
CN901 30P B TO B
POWER LED
SW 5V
G
FRP
B
CSY
R
HSY
VSY
DOP
RGB VIDEO
RGB C
REG GND
VIDEO 5V
REG GND
VIDEO 5V
JOG
STILL.SLOW
WRITE/ HOLD
PAL60
P6/ P5
V.MUTE
SCK
D/A STB
D/A 2TO3
CG CS
SO BUS
COSMO RESET
VSL -8V
VSL -8V
TO MA-137 BOARD CN007
(See Page 97)
TO MA-137 BOARD CN015
(See Page 97)
TO MA-137 BOARD CN016
(See Page 97)
CN503
CN502
W501
KEY
BACK
CHARACTER POSITION
HUE
COLOR
fsc
LND901
LND902
LND903
LND904
GND
IC903 µPD6453OT-622-E2
IC906 M62352OP-E1
IC902 CXA1485Q-T4
IC905 TC4S11F
IC904 TC4S30F
B CLP
G CLP
R CLP
B AMP
G AMP
R AMP
B BUFF
G BUFF
R BUFF
GA CONT
PULSE OSC
ALT SW
COM CONT
BRT CONT
SHP
CLAMP
BLK GEN
VREF
SYNC SEP
BF GEN
APL AMP
SIG AMP
APL DET
SYNC SLICE
BURST GATE
ACC DET
ACK DET
TRAP
BPF
ACC
BLK
ACK
CHROMA AMP
DEM
Y/C MIX
HUE
PS
APC
VXO
LPF
09

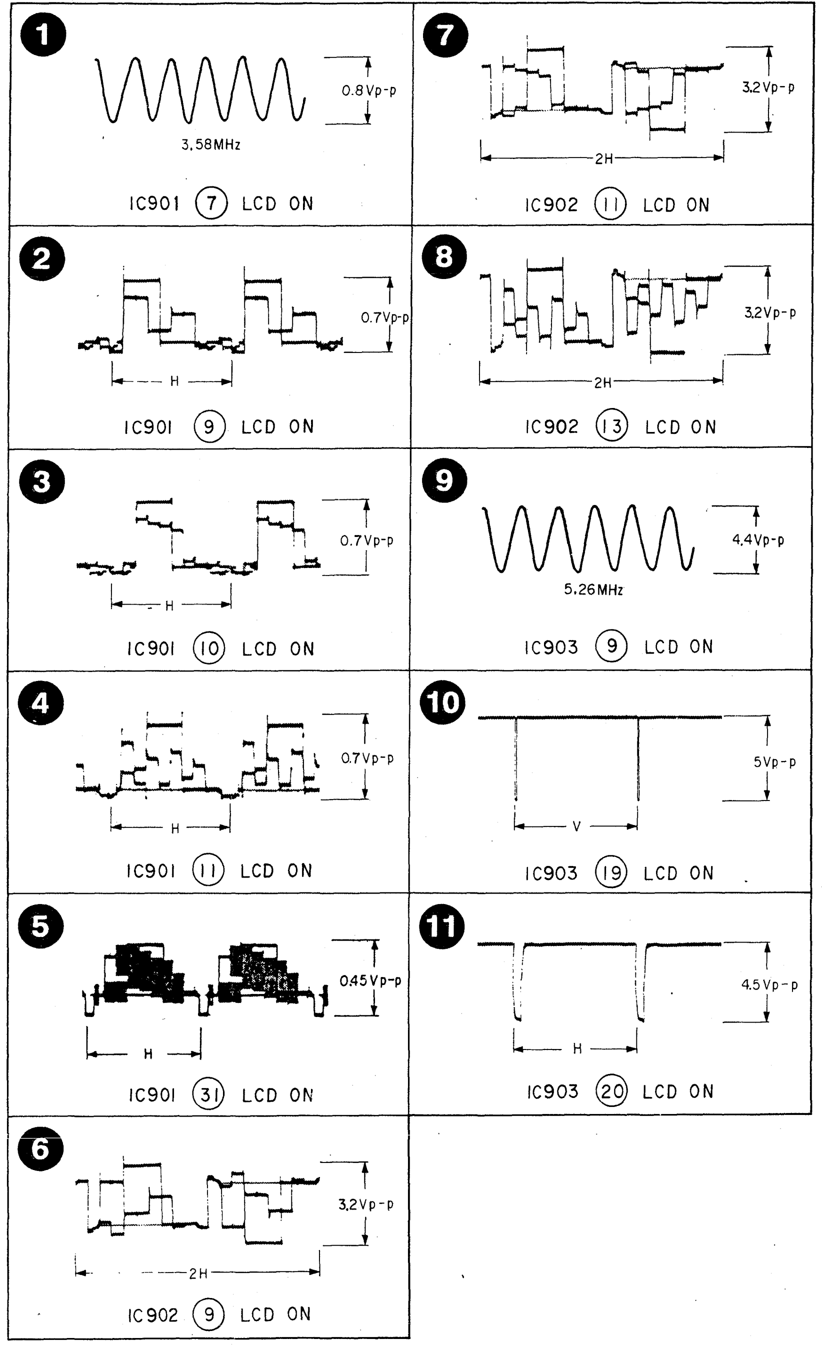
• SI

REC
PB

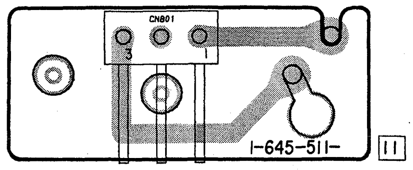

VR-39 BOARD
CN503 12P 0.5 ZIF
REG GND 1
KEY AD IN 2 2
BACK LIGHT ON 3
BL UNREG 4
BL UNREG 5
BL UNREG 6
BL GND 7
BL GND 8
BL GND 9
WRITE/ HOLD 10
JOG VD 11
-20V 12
TO MA-137 BOARD CN015
Page 97)
CN502 14P 0.5 ZIF
HSY 1
FRP 2
CSY 3
B 4
R 5
G 6
REG GND 7
REG GND 8
VSH 5V 9
VSH 5V 10
VSL -8V 11
NTSC/ PAL 12
VSY 13
+13V 14
TO MA-137 BOARD CN016
Page 97)
W501 16P 0.5
HSY 1
FRP 2
CSY 3
VGH 4
VGL 5
B 6
R 7
G 8
REG GND 9
VSH 5V 10
VSL -8V 11
VCDC 12
NTSC/ PAL 13
VSY 14
Q VD 15
WRITE/ HOLD 16
V1 V2 V3 V4 V5 V6 V7 V8 V9 V10 V11 V12
B R G
CL504 CL505 CL506 CL507 CL508
C501 22 16V
L501 4.7μH
CL501 CL502 CL503
CN501 3P 1.5 L
3 BL UNREG
2 BACK LIGHT ON
1 BL GND
ENTER S506
MENU S505 R505 10k
BRT − S504 R504 4700
BRT + S503 R503 3300
VOL − S502 R502 2200
VOL + S501 R501 2200
C502 0.01 F
LND501 GND
LCD901
LIQUID CRYSTAL DISPLAY
1 HSY
2 FRP
3 CSY
4 VGH
5 VGL
6 B
7 R
8 G
9 REG GND
10 VSH 5V
11 VSL -8V
12 VCDC
13 NTSC/ PAL
14 VSY
15 Q VD
16 WRITE/ HOLD


D/A INVERTER
⚠
BL UNREG 3
BACK LIGHT ON 2
BL GND 1
1 LOW HEATER
2 N.C
3 LOW GND
1 HIGH HEATER
2 N.C
3 HIGH GND
BL901 BACK LIGHT
LA-22 BOARD
LND801
LND802
2.0 BtoB CN801 3P
1 LOW HEATER
2 N.C
3 LOW GND
LA-23 BOARD
LND803
LND804
2.0 BtoB CN802 3P
1 HIGH HEATER
2 N.C
3 HIGH GND

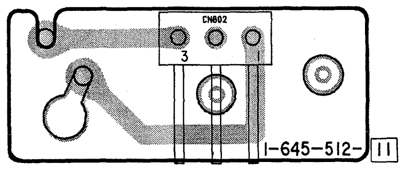
RG-25 BOARD



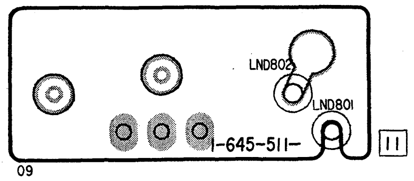
LA-22 BOARD
(COMPONENT SIDE)


CN801
3
1
1-645-511-
11

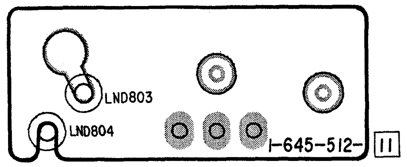
LA-23 BOARD
(COMPONENT SIDE)


CN802
3
1-645-512-
11

LA-22 BOARD
(CONDUCTOR SIDE)


LND802
LND801
1-645-511-
11
09

LA-23 BOARD
(CONDUCTOR SIDE)


LND803
LND804
1-645-512-
11

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡⋙	
PB	⇨	⇨≫	⇨⋙	

AU-136 (AUDIO) PRINTED WIRING BOARD

(DIODE)

D054	8-719-989-03	DIODE DAN222
D055	8-719-989-03	DIODE DAN222
D401	8-719-989-03	DIODE DAN222
D402	8-719-989-00	DIODE DA221
D403	8-719-420-81	DIODE MA3075WA
D404	8-719-420-81	DIODE MA3075WA
D405	8-719-420-81	DIODE MA3075WA

(IC)

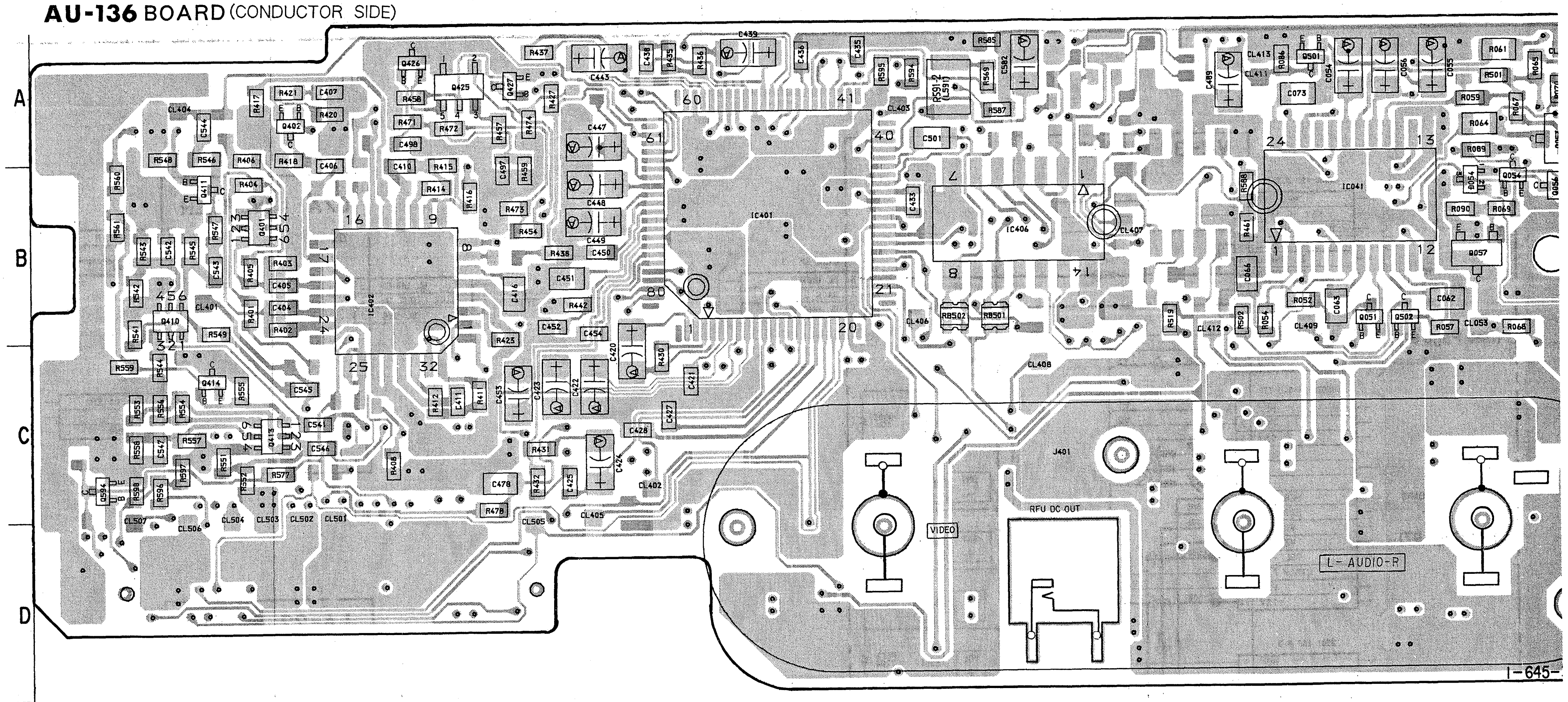
IC041	8-759-510-56	IC BA3570FS
IC042	8-759-701-02	IC NJM2073M
IC043	8-759-234-77	IC TC4S66F
IC401	8-759-077-12	IC CXA1542R
IC402	8-752-334-42	IC CXD2106Q
IC403	8-752-053-21	IC CXA1211M
IC404	8-759-108-09	IC uPD4012BG
IC406	8-759-108-09	IC uPD4012BG

(TRANSISTOR)

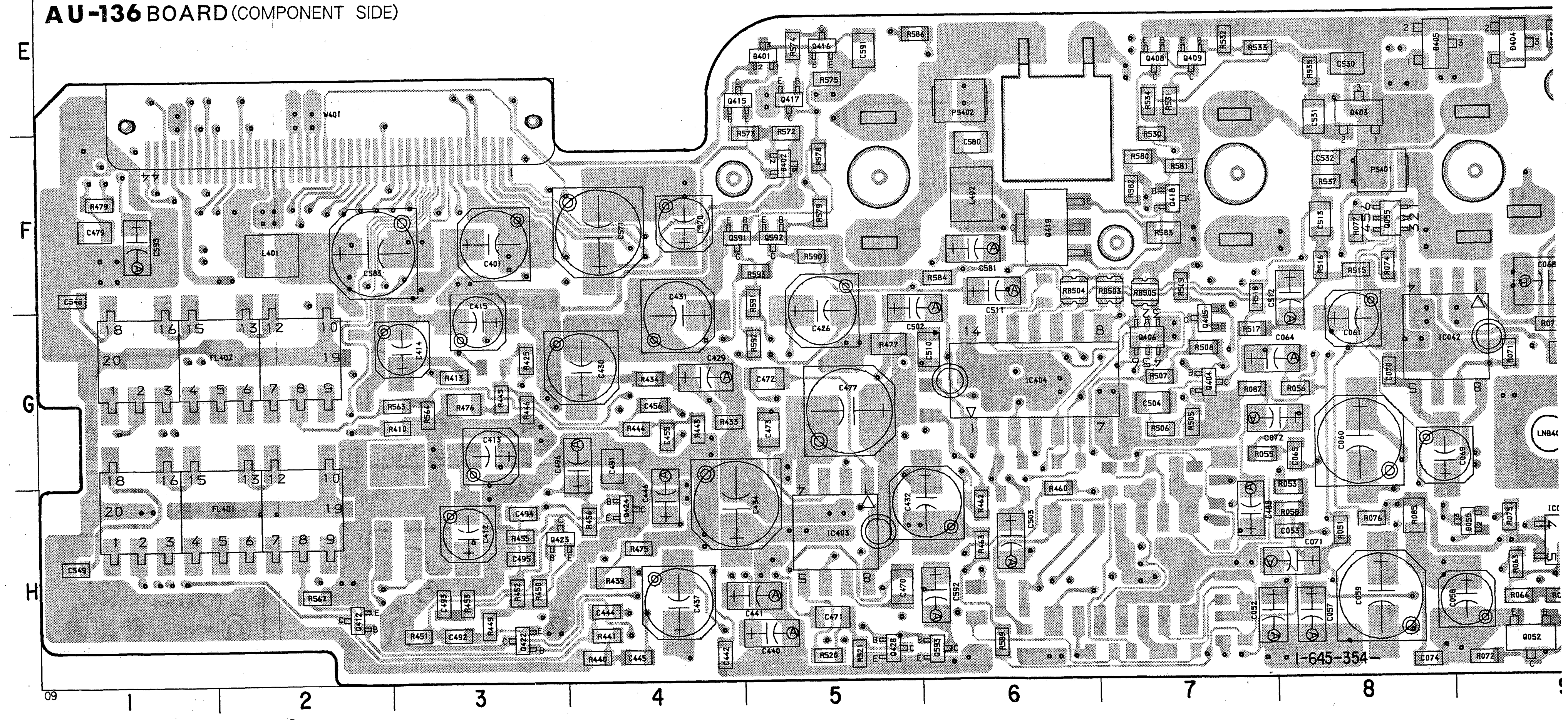
Q051	8-729-928-81	TRANSISTOR DTC144EE
Q052	8-729-202-38	TRANSISTOR 2SC3326N-A
Q053	8-729-202-38	TRANSISTOR 2SC3326N-A
Q054	8-729-928-87	TRANSISTOR DTC124EE
Q055	8-729-927-62	TRANSISTOR UMX1
Q056	8-729-928-81	TRANSISTOR DTC144EE
Q057	8-729-141-48	TRANSISTOR 2SB624-BV345
Q401	8-729-927-62	TRANSISTOR UMX1
Q402	8-729-927-XX	TRANSISTOR 2SC4617R
Q404	8-729-927-XX	TRANSISTOR 2SC4617R
Q405	8-729-927-XX	TRANSISTOR 2SC4617R
Q406	8-729-930-13	TRANSISTOR UMH2
Q408	8-729-927-XX	TRANSISTOR 2SC4617R
Q409	8-729-927-XX	TRANSISTOR 2SC4617R
Q410	8-729-927-62	TRANSISTOR UMX1
Q411	8-729-927-XX	TRANSISTOR 2SC4617R
Q412	8-729-928-81	TRANSISTOR DTC144EE
Q413	8-729-927-62	TRANSISTOR UMX1
Q414	8-729-927-XX	TRANSISTOR 2SC4617R
Q415	8-729-928-19	TRANSISTOR 2SA1774R
Q416	8-729-928-81	TRANSISTOR DTC144EE
Q417	8-729-928-19	TRANSISTOR 2SA1774R
Q418	8-729-927-XX	TRANSISTOR 2SC4617R
Q419	8-729-141-48	TRANSISTOR 2SB624-BV345
Q422	8-729-928-19	TRANSISTOR 2SA1774R
Q423	8-729-927-XX	TRANSISTOR 2SC4617R
Q424	8-729-927-XX	TRANSISTOR 2SC4617R
Q425	8-729-903-10	TRANSISTOR FMW1
Q426	8-729-927-XX	TRANSISTOR 2SC4617R
Q427	8-729-928-19	TRANSISTOR 2SA1774R
Q428	8-729-928-81	TRANSISTOR DTC144EE
Q501	8-729-927-XX	TRANSISTOR 2SC4617R
Q502	8-729-927-XX	TRANSISTOR 2SC4617R
Q591	8-729-927-XX	TRANSISTOR 2SC4617R
Q592	8-729-927-XX	TRANSISTOR 2SC4617R
Q593	8-729-928-90	TRANSISTOR DTC114EE
Q594	8-729-928-81	TRANSISTOR DTC144EE

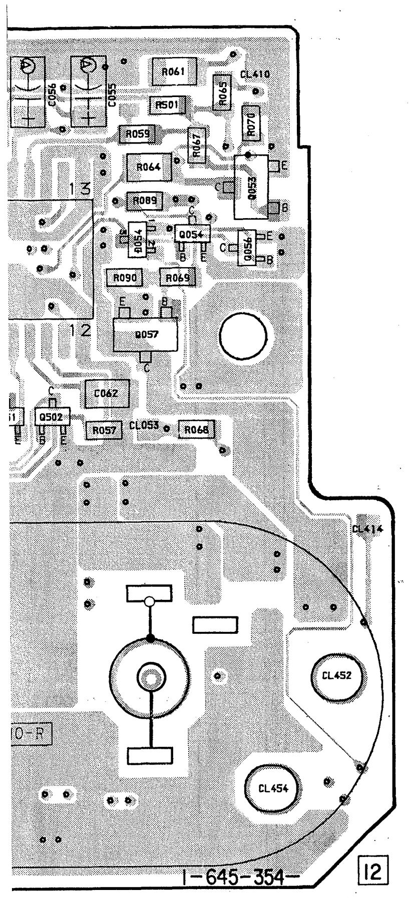
AU-136	BOARD
D054	B-9
D055	H-9
D401	E-5
D402	F-5
D403	E-8
D404	E-9
D405	E-8
IC041	B-8
IC042	G-8
IC043	H-9
IC401	B-5
IC402	B-2
IC403	H-5
IC404	G-6
IC406	B-6
Q051	B-8
Q052	H-9
Q053	A-9
Q054	B-9
Q055	F-8
Q056	B-9
Q057	B-9
Q401	B-2
Q402	A-2
Q404	G-7
Q405	G-7
Q406	G-7
Q408	E-7
Q409	E-7
Q410	B-1
Q411	B-1
Q412	H-2
Q413	C-2
Q414	C-1
Q415	E-5
Q416	E-5
Q417	E-5
Q418	F-7
Q419	F-6
Q422	H-3
Q423	H-3
Q424	H-4
Q425	A-3
Q426	A-3
Q427	A-3
Q428	H-5
Q501	A-8
Q502	B-8
Q591	F-4
Q592	F-5
Q593	H-6
Q594	C-1

AU-136 BOARD (CONDUCTOR SIDE)

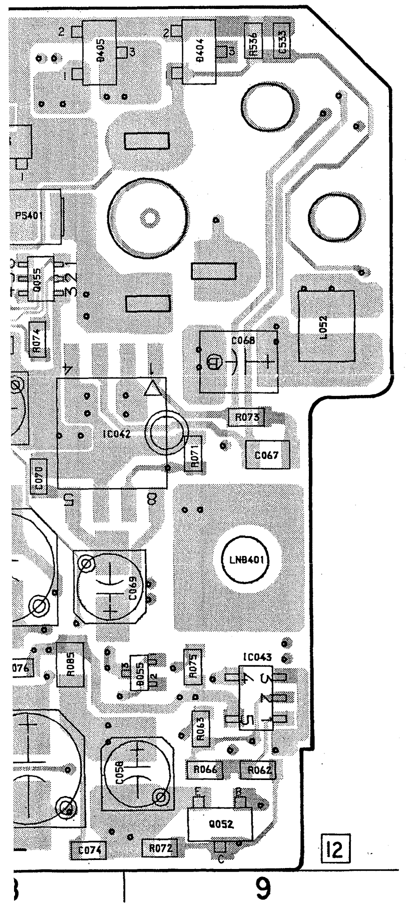


AU-136 BOARD (COMPONENT SIDE)

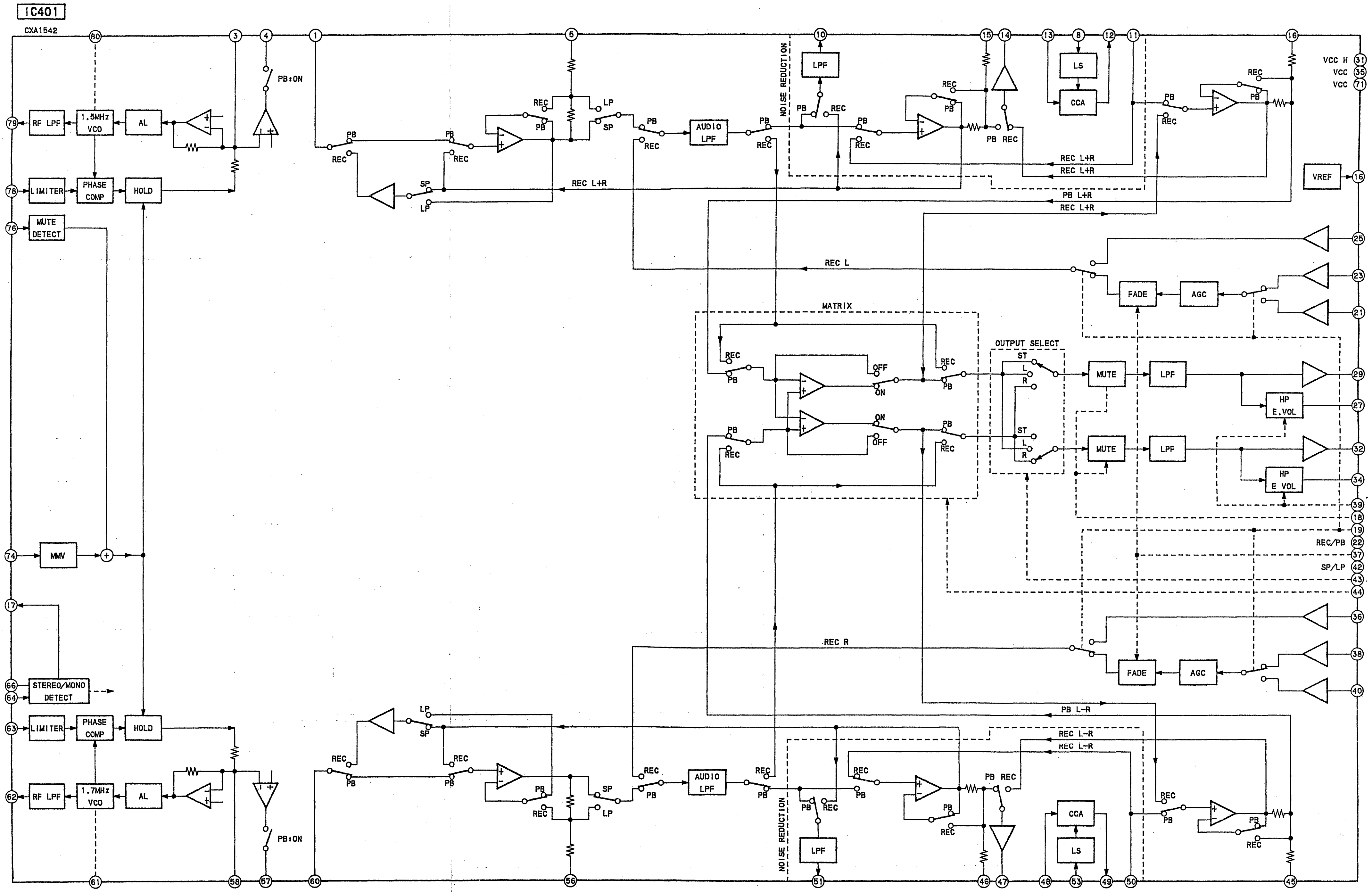




R061
CL410
R501
R059
R064
R089
Q054
Q053
R090
R069
Q057
C062
Q502
R057
CL053
R068
CL414
CL452
CL454
1-645-354-
12

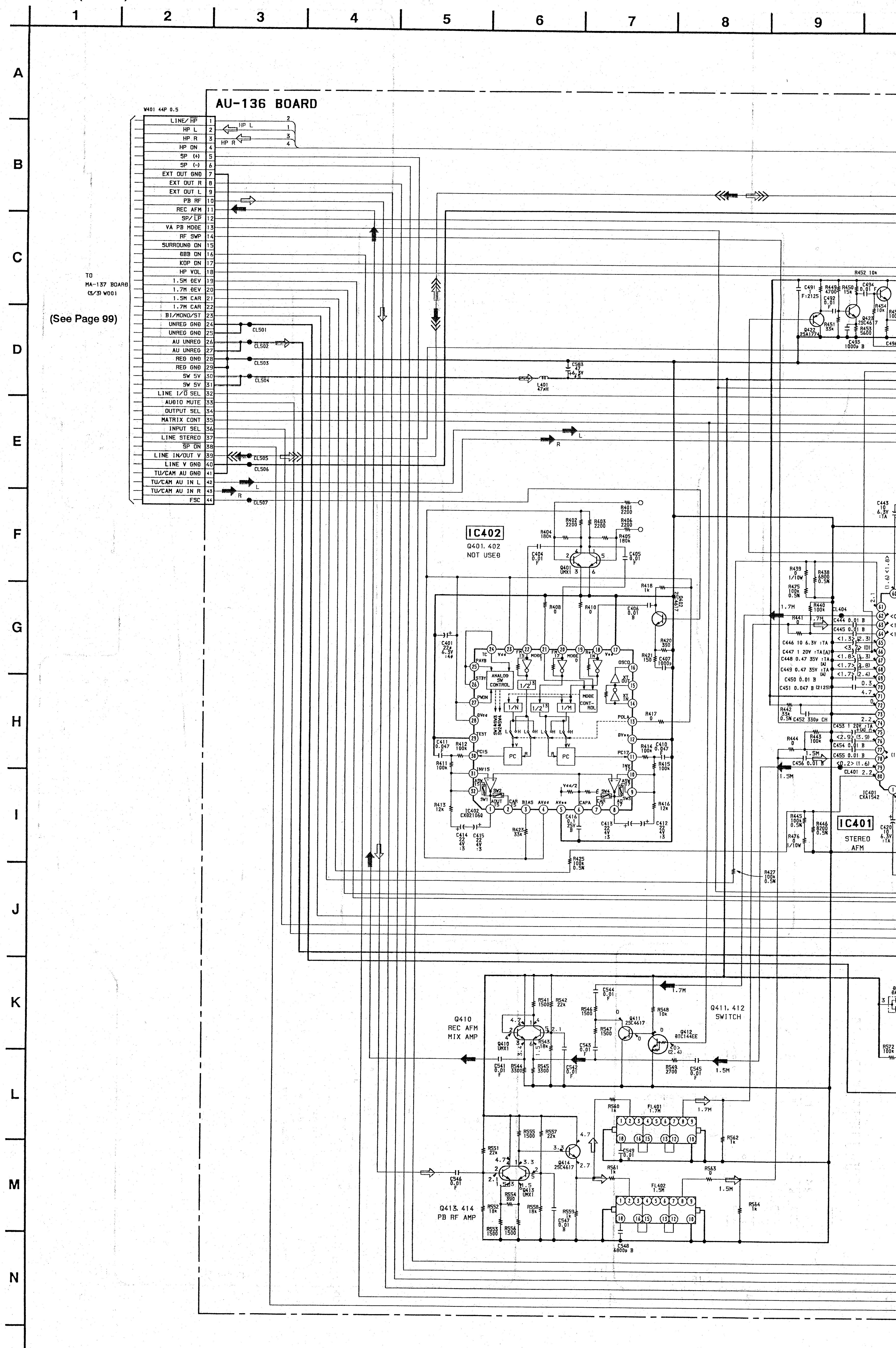


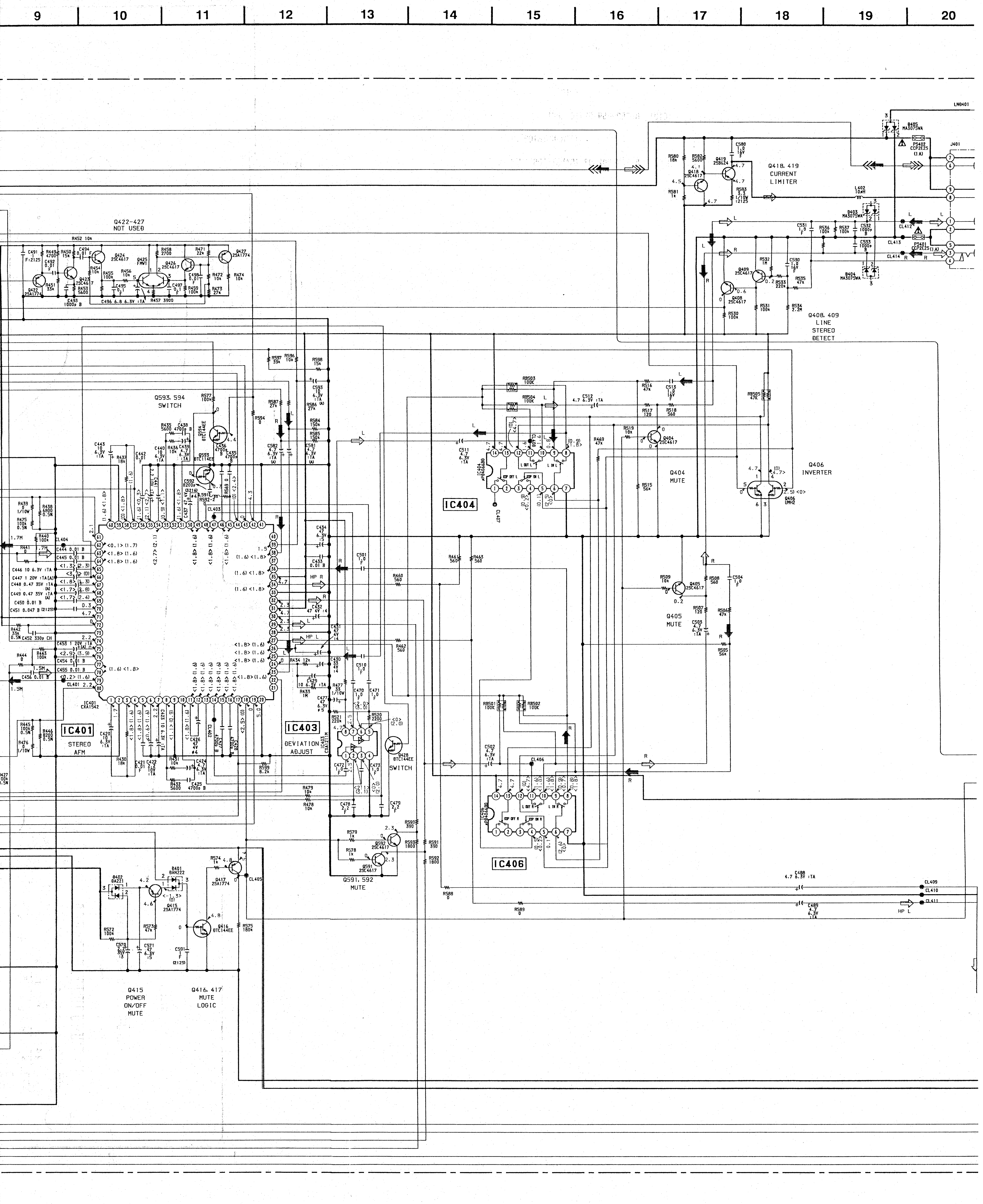
Q405
Q404
R536
R533
PS401
Q055
R074
C068
L052
IC042
R073
R071
C067
C070
LNB401
C069
R085
IC043
R063
C058
R066
R062
Q052
C074
R072
12
9

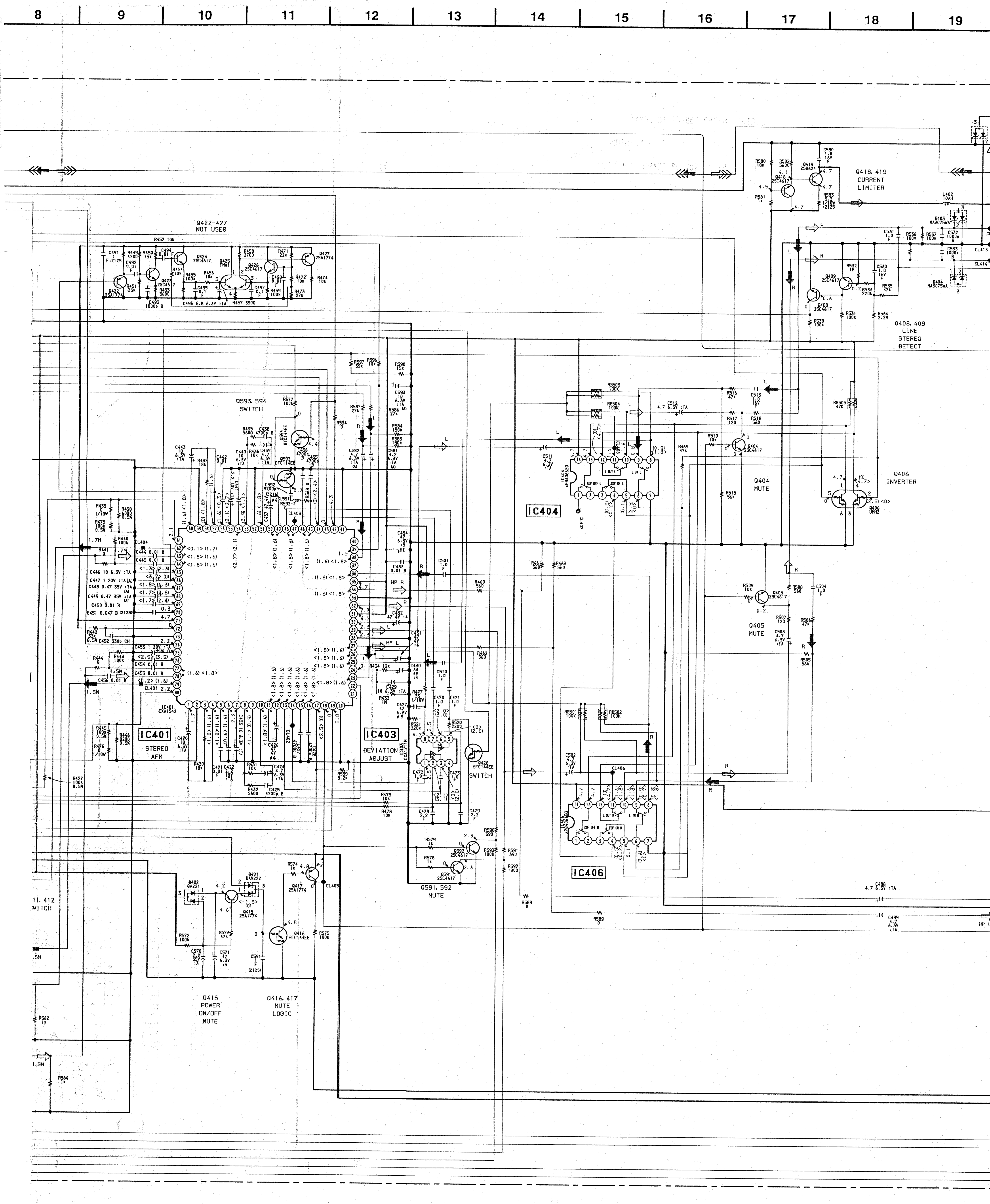


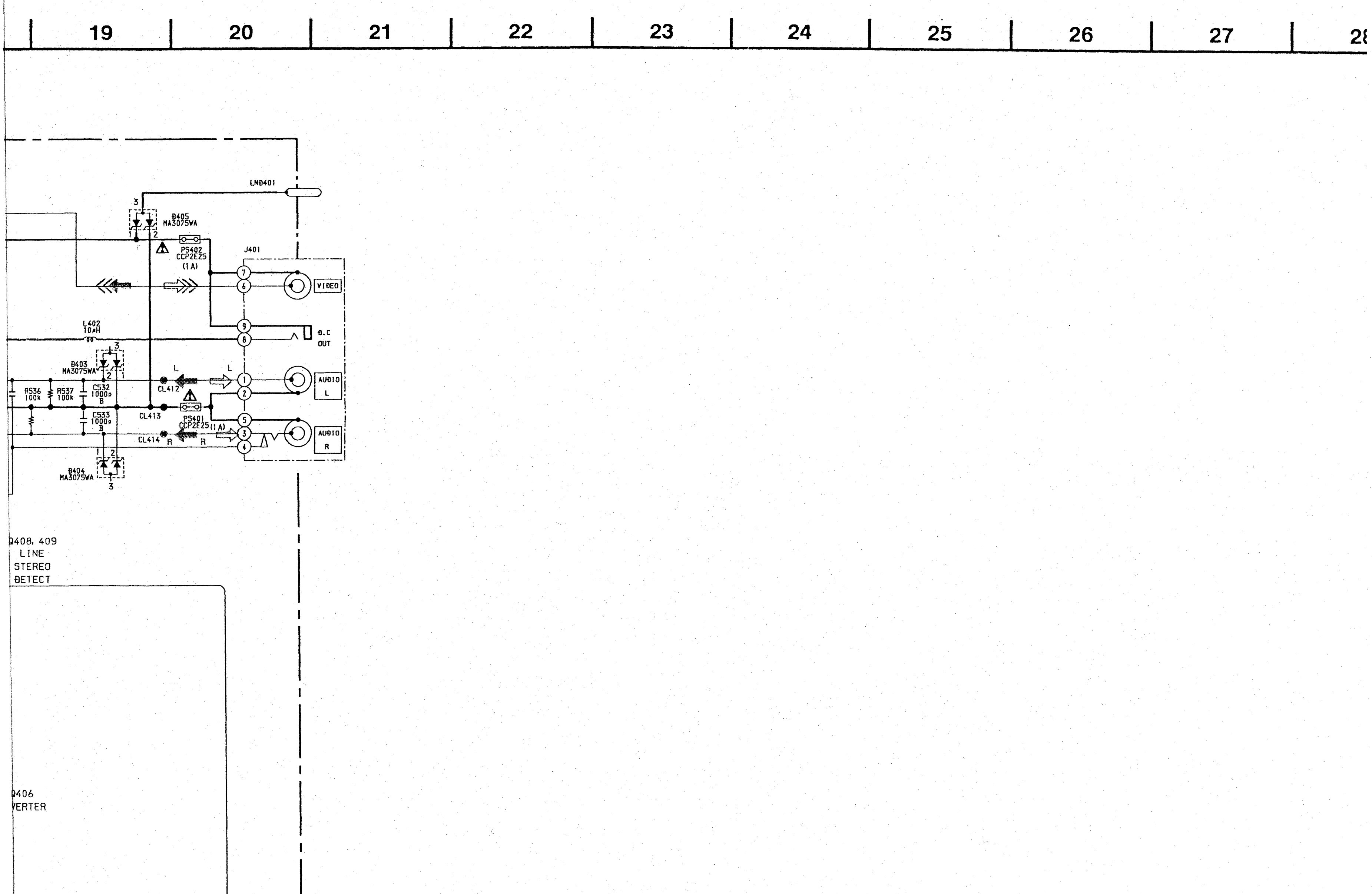
IC401
CXA1542
RF LPF
1.5MHz VCO
AL
LIMITER
PHASE COMP
HOLD
MUTE DETECT
MMV
STEREO/MONO DETECT
1.7MHz VCO
PB:ON
REC
PB
SP
LP
REC L+R
AUDIO LPF
NOISE REDUCTION
LPF
LS
CCA
PB L+R
REC L
REC R
PB L-R
REC L-R
VREF
VCC H
VCC
FADE
AGC
MATRIX
OFF
ON
OUTPUT SELECT
ST
L
R
MUTE
HP E.VOL
REC/PB
SP/LP

AU-136 (AUDIO) SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
AU-136 BOARD
W401 44P 0.5
TO
MA-137 BOARD
(5/3) W001
(See Page 99)
LINE/HP 1
HP L 2
HP R 3
HP ON 4
SP (+) 5
SP (-) 6
EXT OUT GND 7
EXT OUT R 8
EXT OUT L 9
PB RF 10
REC AFM 11
SP/LP 12
VA PB MODE 13
RF SWP 14
SURROUND ON 15
BBB ON 16
KOP ON 17
HP VOL 18
1.5M BEV 19
1.7M BEV 20
1.5M CAR 21
1.7M CAR 22
BI/MONO/ST 23
UNREG GND 24
UNREG GND 25
AU UNREG 26
AU UNREG 27
REG GND 28
REG GND 29
SW 5V 30
SW 5V 31
LINE I/O SEL 32
AUDIO MUTE 33
OUTPUT SEL 34
MATRIX CONT 35
INPUT SEL 36
LINE STEREO 37
SP ON 38
LINE IN/OUT V 39
LINE V GND 40
TU/CAM AU GND 41
TU/CAM AU IN L 42
TU/CAM AU IN R 43
FSC 44
HP L
HP R
CL501
CL502
CL503
CL504
CL505
CL506
CL507
L401 47μH
C583 47 6.3V
IC402
Q401, 402 NOT USED
IC402 CXD2106Q
ANALOG SW CONTROL
MODE CONT-ROL
PC
Q410 REC AFM MIX AMP
Q411, 412 SWITCH
Q413, 414 PB RF AMP
FL401 1.7M
FL402 1.5M
IC401 STEREO AFM
IC401 CXA1542
R452 10k
1.7M
1.5M

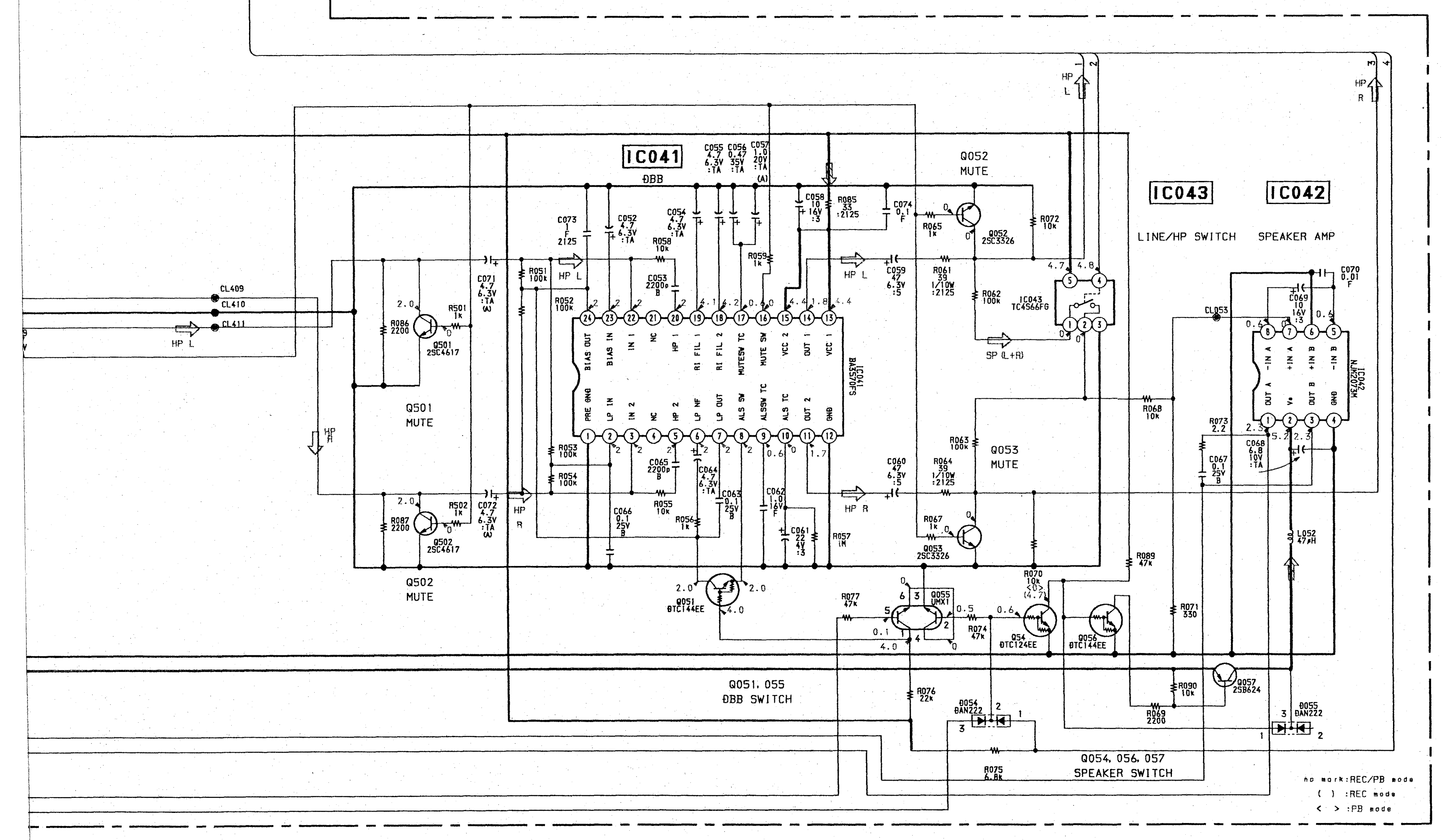

9
10
11
12
13
14
15
16
17
18
19
20
IC401
CXA1542
STEREO
AFM
IC403
CXA1211M
DEVIATION
ADJUST
IC404
μPD4066BB
IC406
μPD4066BB
Q422-427
NOT USED
Q593, 594
SWITCH
Q426
DTC144EE
SWITCH
Q591, 592
MUTE
Q415
POWER
ON/OFF
MUTE
Q416, 417
MUTE
LOGIC
Q404
MUTE
Q405
MUTE
Q406
INVERTER
Q408, 409
LINE
STEREO
DETECT
Q418, 419
CURRENT
LIMITER
J401
LN0401
PS401
PS402
CL409
CL410
CL411
HP L
HP R


8
9
10
11
12
13
14
15
16
17
18
19
Q422-427
NOT USED
Q593, 594
SWITCH
IC401
CXA1542
STEREO
AFM
IC403
CXA1211M
DEVIATION
ADJUST
Q428
BTC144EE
SWITCH
Q591, 592
MUTE
Q415
POWER
ON/OFF
MUTE
Q416, 417
MUTE
LOGIC
11, 412
SWITCH
IC404
μPD4066BG
Q404
MUTE
Q405
MUTE
Q406
INVERTER
IC406
μPD4066BG
Q418, 419
CURRENT
LIMITER
Q408, 409
LINE
STEREO
DETECT
HP R
HP L
L
R


19
20
21
22
23
24
25
26
27
LND401
D405
MA3075WA
PS402
CCP2E25
(1A)
J401
VIDEO
L402
10μH
D.C
OUT
D403
MA3075WA
R536
100k
R537
100k
C532
1000p
B
C533
1000p
B
CL412
CL413
CL414
PS401
CCP2E25 (1A)
AUDIO
L
AUDIO
R
D404
MA3075WA
D408, 409
LINE
STEREO
DETECT
D406
VERTER

- SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡»	➡
PB			⇨»	⇨


IC041
DBB
IC043
LINE/HP SWITCH
IC042
SPEAKER AMP
Q501
MUTE
Q502
MUTE
Q052
MUTE
Q053
MUTE
Q051, 055
DBB SWITCH
Q054, 056, 057
SPEAKER SWITCH
IC041
BA3570FS
IC043
TC4S66FU
IC042
NJM2073M
CL409
CL410
CL411
HP L
HP R
SP (L+R)
D054
DAN222
D055
DAN222
L052
47μH
no mark:REC/PB mode
( ) :REC mode
< > :PB mode

SL-26 (FG/PG WAVEFORM SHAPING), FP-442 (MODE SWITCH), LM-40 (LOADING MOTOR), LS-33 (MECH SENSOR) PRINTED WIRING BOARDS

- FP-442, LM-40, LS-33 boards are replaced as blocks, so that there PRINTED WIRING BOARDS are omitted.

SL-26 BOARD	
IC101	I-3
Q101	H-3

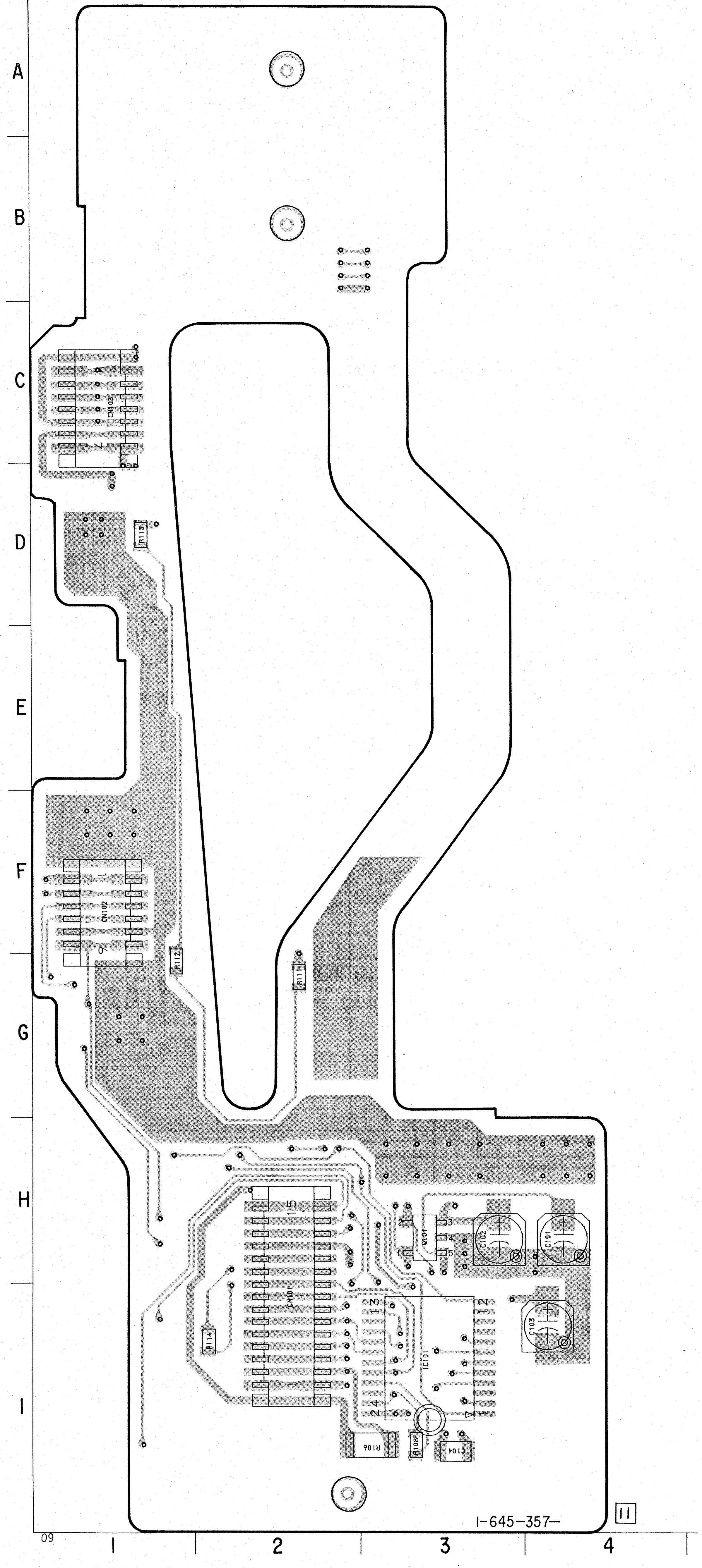
〈 IC 〉

IC101 8-759-059-09 IC LB8111V

〈 TRANSISTOR 〉

Q101 8-729-902-93 TRANSISTOR FMG4

SL-26 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
H
I
1
2
3
4
09
CN103
7
4
R115
CN102
1
9
R112
R111
CN101
1
15
13
24
IC101
12
Q101
1
2
3
4
5
C101
C102
C103
C104
R106
R108
R114
1-645-357-
11

SL-26 (FG/PG WAVEFORM SHAPING), FP-442 (MODE SWITCH), LM-40 (LOADING MOTOR), LS-33 (MECH SENSOR) PRINTED WIRING BOARDS

- FP-442, LM-40, LS-33 boards are replaced as blocks, so that there PRINTED WIRING BOARDS are omitted.

SL-26	BOARD
IC101	I-3
Q101	H-3

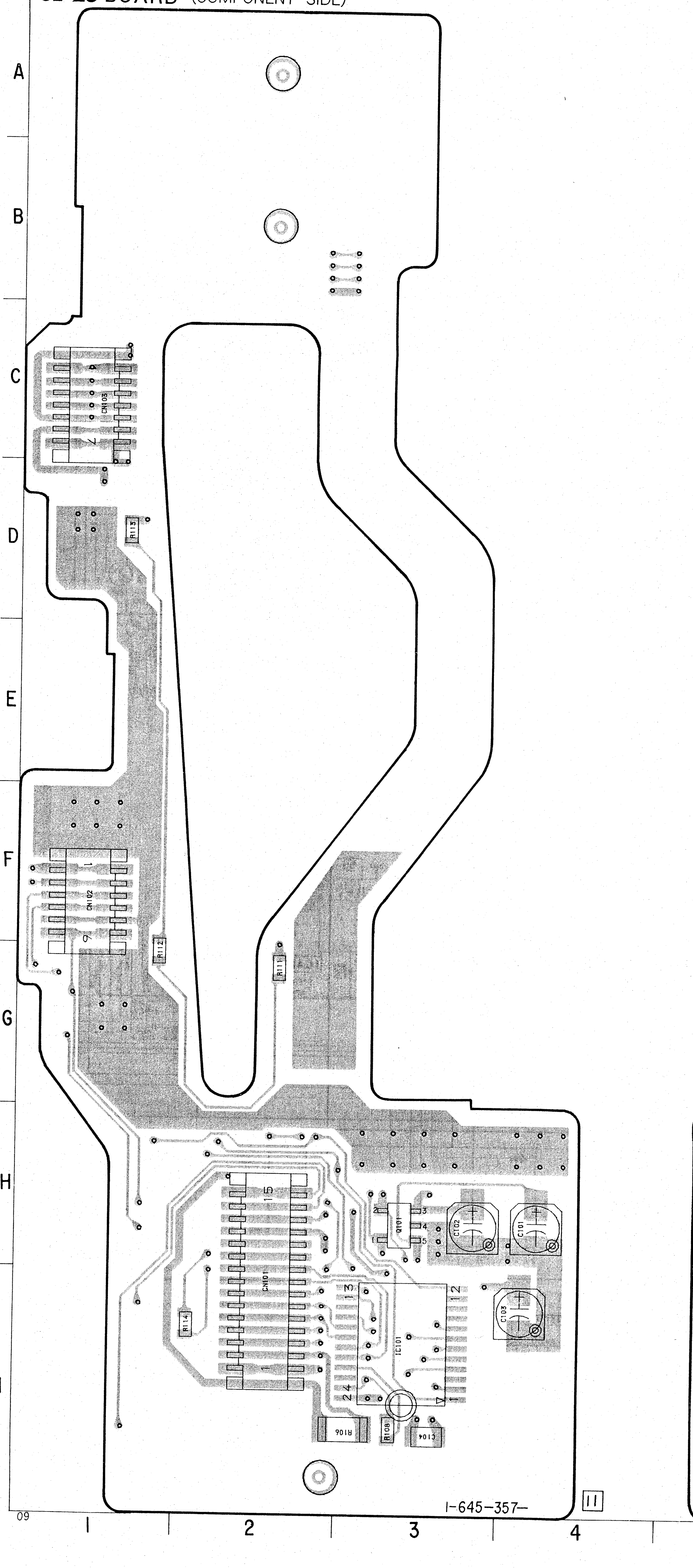
(IC)

IC101 8-759-059-09 IC LB8111V

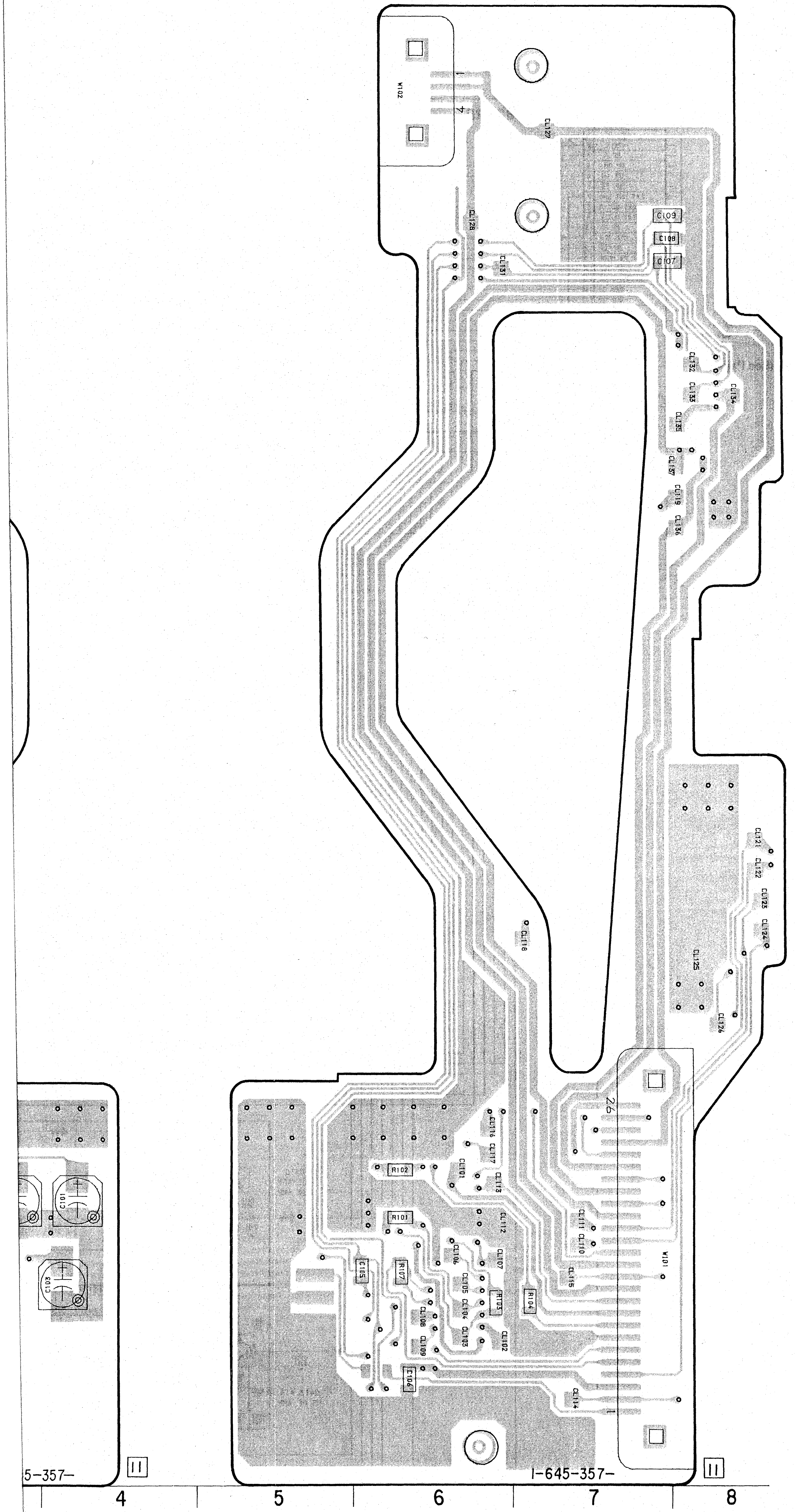
(TRANSISTOR)

Q101 8-729-902-93 TRANSISTOR FMG4

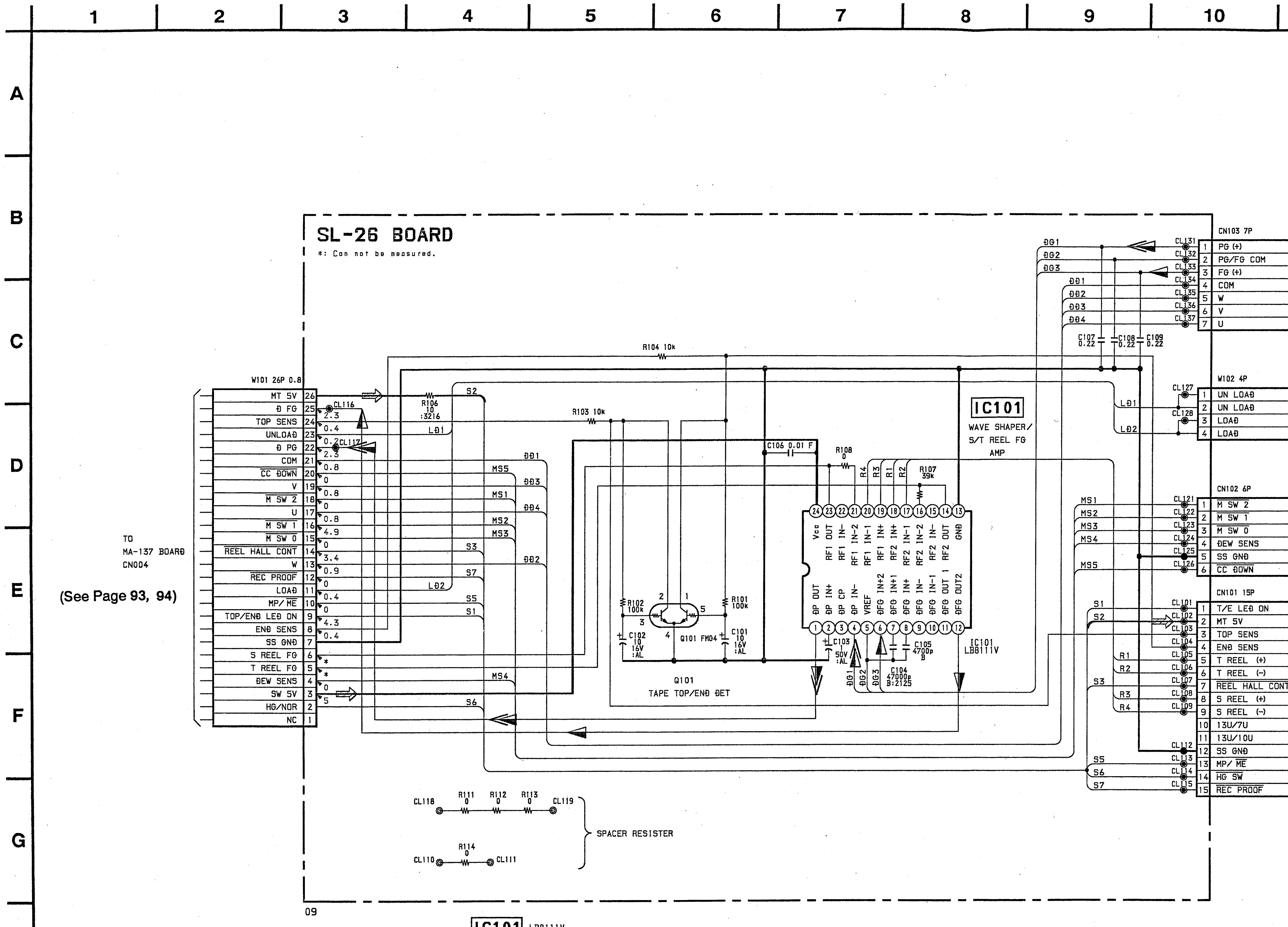
SL-26 BOARD (COMPONENT SIDE)

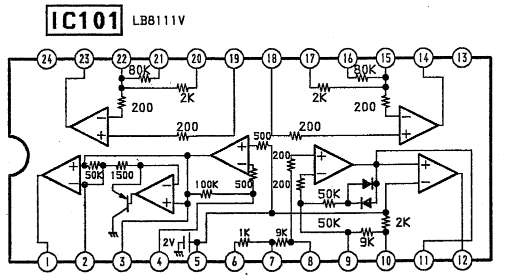

A
B
C
D
E
F
G
H
I
1
2
3
4
09
CN103
7
4
R113
CN102
1
6
R112
R111
CN101
1
15
R114
IC101
24
13
1
12
Q101
3
4
5
C101
C102
C103
C104
R106
R108
1-645-357-
11

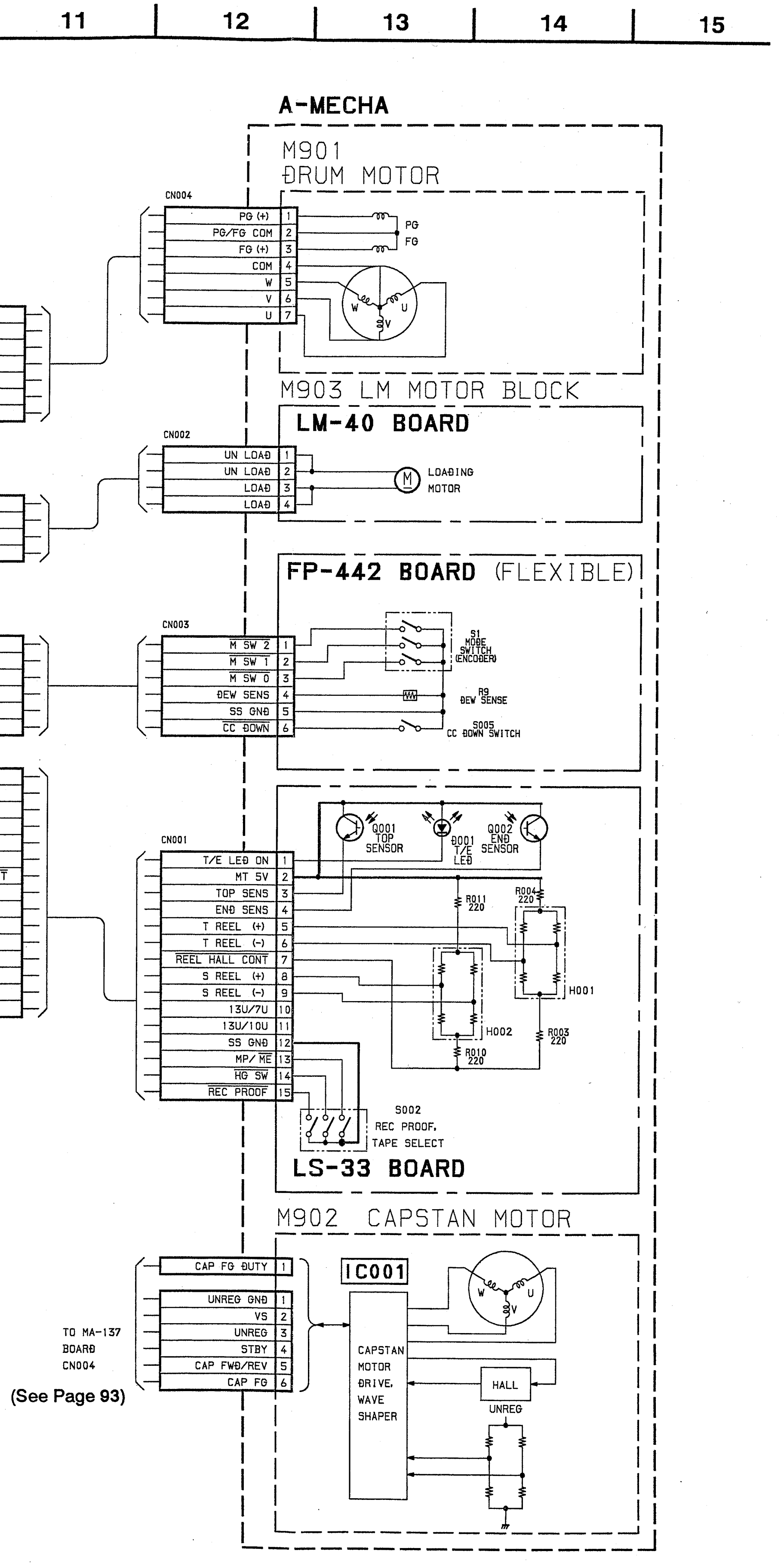
SL-26 BOARD (CONDUCTOR SIDE)


1
4
W102
CL127
CL128
CL131
C109
C108
C107
CL132
CL133
CL134
CL135
CL137
CL119
CL136
CL121
CL122
CL123
CL124
CL125
CL126
CL118
26
CL116
CL117
CL101
CL113
R102
R101
CL112
CL111
CL110
W101
CL115
CL107
CL106
C105
R107
CL105
CL104
R103
R104
CL108
CL103
CL102
CL109
C104
CL114
C101
C103
5-357-
11
1-645-357-
11
4
5
6
7
8

SL-26 (FG/PG WAVEFORM SHAPING), FP-442 (MODE SWITCH), LM-40 (LOADING MOTOR), LS-33 (MECH SENSOR) SCHEMATIC DIAGRAMS


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
SL-26 BOARD
*: Can not be measured.
W101 26P 0.8
TO MA-137 BOARD CN004
(See Page 93, 94)
MT 5V
D FG
TOP SENS
UNLOAD
D PG
COM
CC DOWN
V
M SW 2
U
M SW 1
M SW 0
REEL HALL CONT
W
REC PROOF
LOAD
MP/ME
TOP/END LED ON
END SENS
SS GND
S REEL FG
T REEL FG
DEW SENS
SW 5V
HG/NOR
NC
IC101
WAVE SHAPER/ S/T REEL FG AMP
IC101 LB8111V
Q101 FMG4
Q101 TAPE TOP/END DET
R104 10k
R103 10k
R106 10
C106 0.01 F
R108 0
R107 39k
C103 1 50V
C104 47000p
C105 4700p
C101 10 16V
C102 10 16V
R101 100k
R102 100k
CN103 7P
PG (+)
PG/FG COM
FG (+)
COM
W
V
U
C107 0.22
C108 0.22
C109 0.22
W102 4P
UN LOAD
UN LOAD
LOAD
LOAD
CN102 6P
M SW 2
M SW 1
M SW 0
DEW SENS
SS GND
CC DOWN
CN101 15P
T/E LED ON
MT 5V
TOP SENS
END SENS
T REEL (+)
T REEL (-)
REEL HALL CONT
S REEL (+)
S REEL (-)
13U/7U
13U/10U
SS GND
MP/ME
HG SW
REC PROOF
CL118
R111 0
R112 0
R113 0
CL119
R114 0
CL110
CL111
SPACER RESISTER
09


IC101 LB8111V
80K
2K
200
200
80K
2K
200
500
200
50K
1500
100K
500
200
50K
50K
9K
1K
9K
2K
2V


11
12
13
14
15
A-MECHA
M901 DRUM MOTOR
CN004
PG (+)
PG/FG COM
FG (+)
COM
W
V
U
PG
FG
M903 LM MOTOR BLOCK
LM-40 BOARD
CN002
UN LOAD
UN LOAD
LOAD
LOAD
LOADING MOTOR
FP-442 BOARD (FLEXIBLE)
CN003
M SW 2
M SW 1
M SW 0
DEW SENS
SS GND
CC DOWN
S1 MODE SWITCH (ENCODER)
R9 DEW SENSE
S005 CC DOWN SWITCH
CN001
T/E LED ON
MT 5V
TOP SENS
END SENS
T REEL (+)
T REEL (-)
REEL HALL CONT
S REEL (+)
S REEL (-)
13U/7U
13U/10U
SS GND
MP/ME
HG SW
REC PROOF
Q001 TOP SENSOR
D001 T/E LED
Q002 END SENSOR
R011 220
R004 220
H001
H002
R003 220
R010 220
S002 REC PROOF, TAPE SELECT
LS-33 BOARD
M902 CAPSTAN MOTOR
CAP FG DUTY
UNREG GND
VS
UNREG
STBY
CAP FWD/REV
CAP FG
TO MA-137 BOARD CN004
(See Page 93)
IC001
CAPSTAN MOTOR DRIVE, WAVE SHAPER
HALL
UNREG

- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal			

TU-142 (TUNER) PRINTED WIRING BOARD

TU-142 BOARD	
D100	D-10
Q100	C-2
Q102	C-3
Q103	D-3
Q105	D-7
Q106	C-10
Q107	D-10
Q108	B-10
Q109	C-9
Q111	B-9

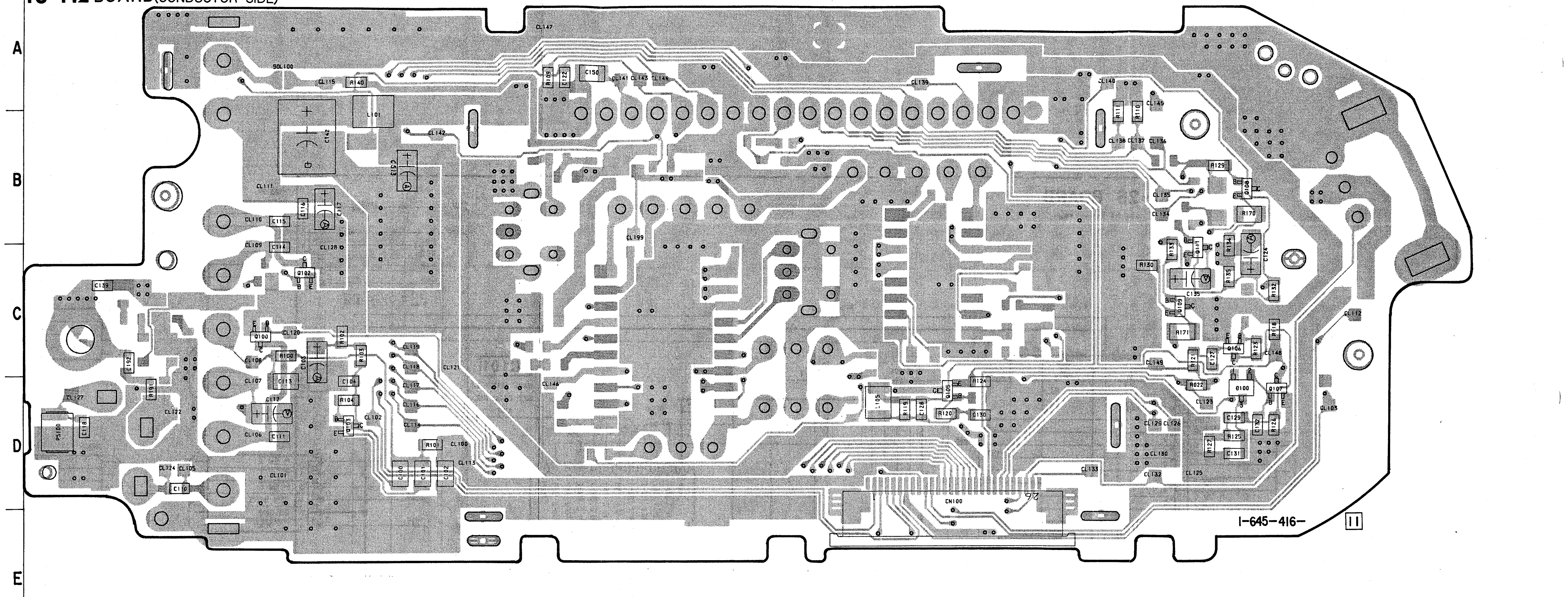
〈 DIODE 〉

D100	8-719-941-09	DIODE DAP202U

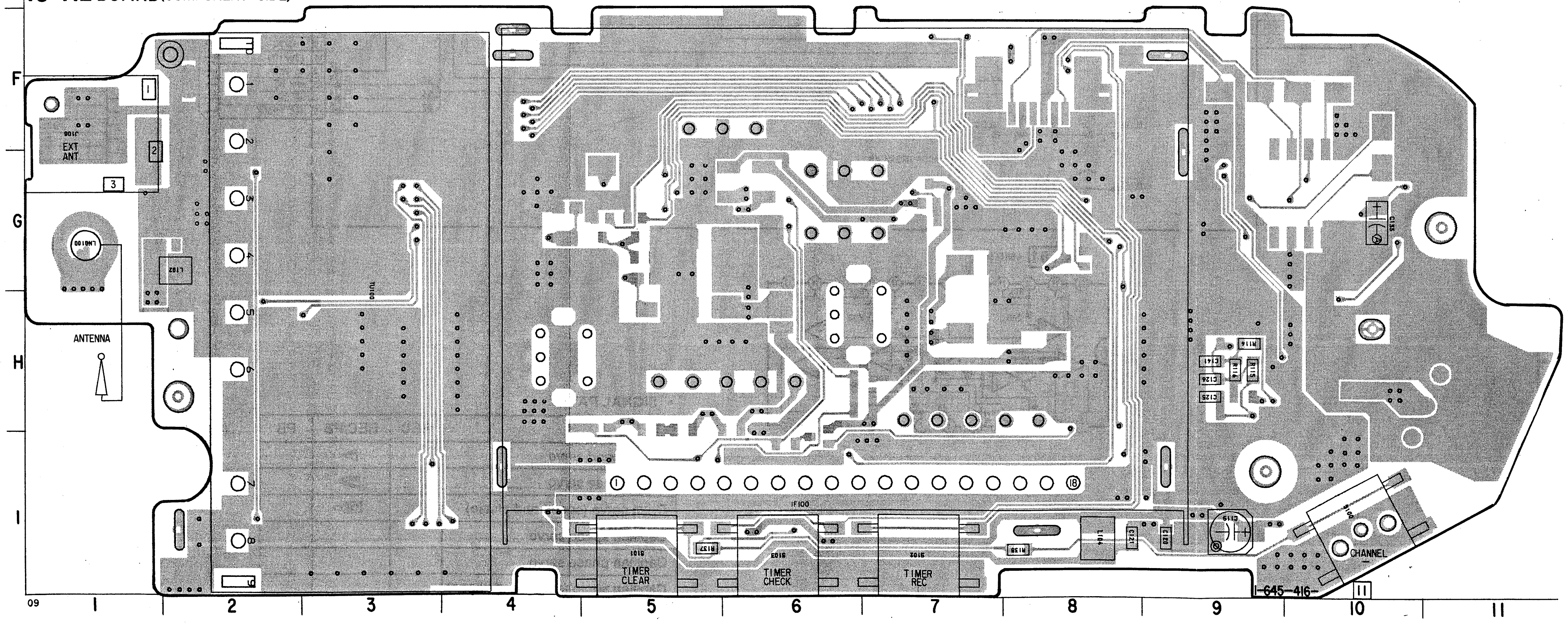
〈 TRANSISTOR 〉

Q100	8-729-928-42	TRANSISTOR DTA143EE
Q102	8-729-928-42	TRANSISTOR DTA143EE
Q103	8-729-425-64	TRANSISTOR 2SD2216Q
Q105	8-729-425-64	TRANSISTOR 2SD2216Q
Q106	8-729-425-50	TRANSISTOR 2SB1462Q
Q107	8-729-425-64	TRANSISTOR 2SD2216Q
Q108	8-729-425-64	TRANSISTOR 2SD2216Q
Q109	8-729-425-64	TRANSISTOR 2SD2216Q
Q111	8-729-425-64	TRANSISTOR 2SD2216Q

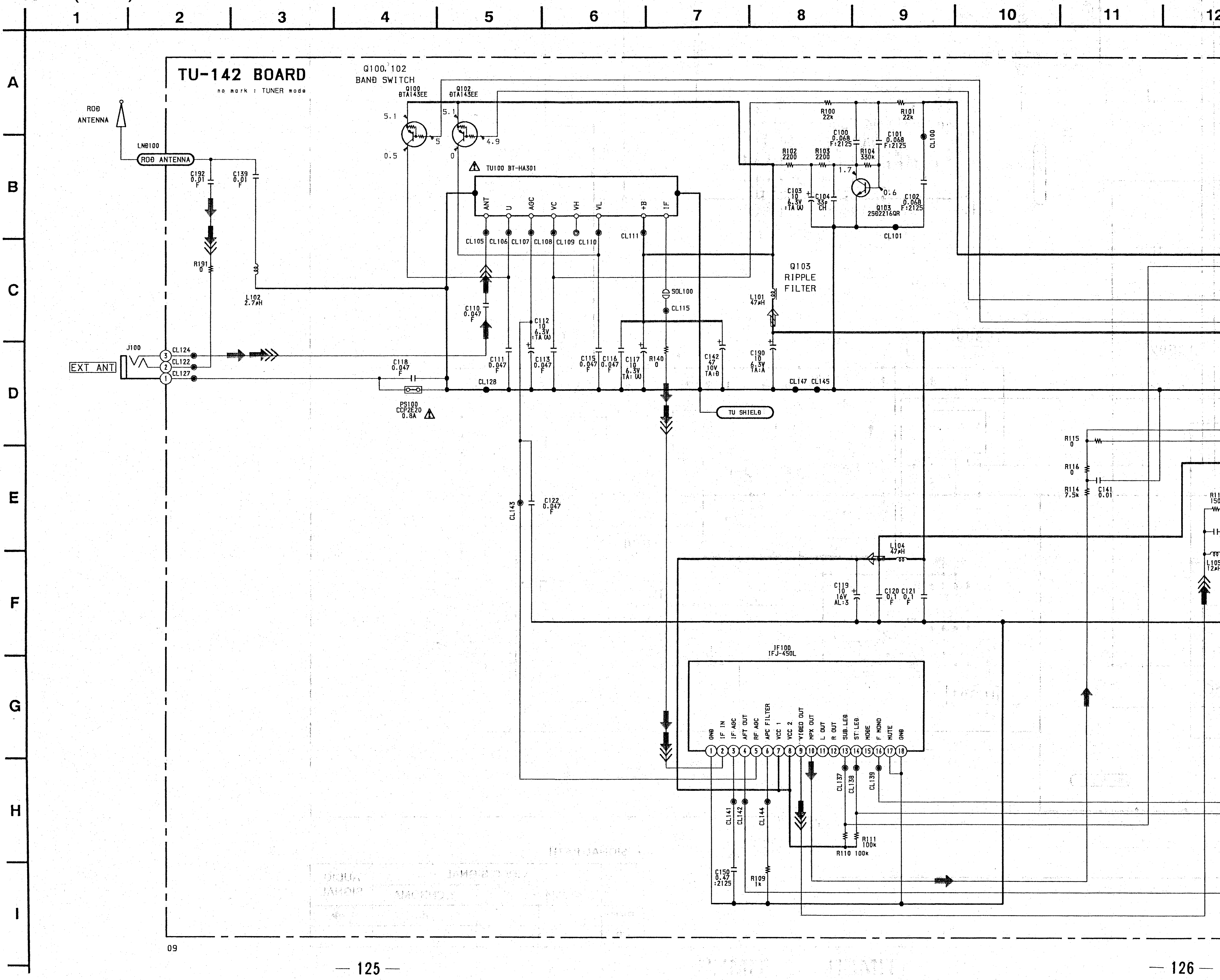
TU-142 BOARD(CONDUCTOR SIDE)


A
B
C
D
E
CN100
1-645-416-
11

TU-142 BOARD(COMPONENT SIDE)

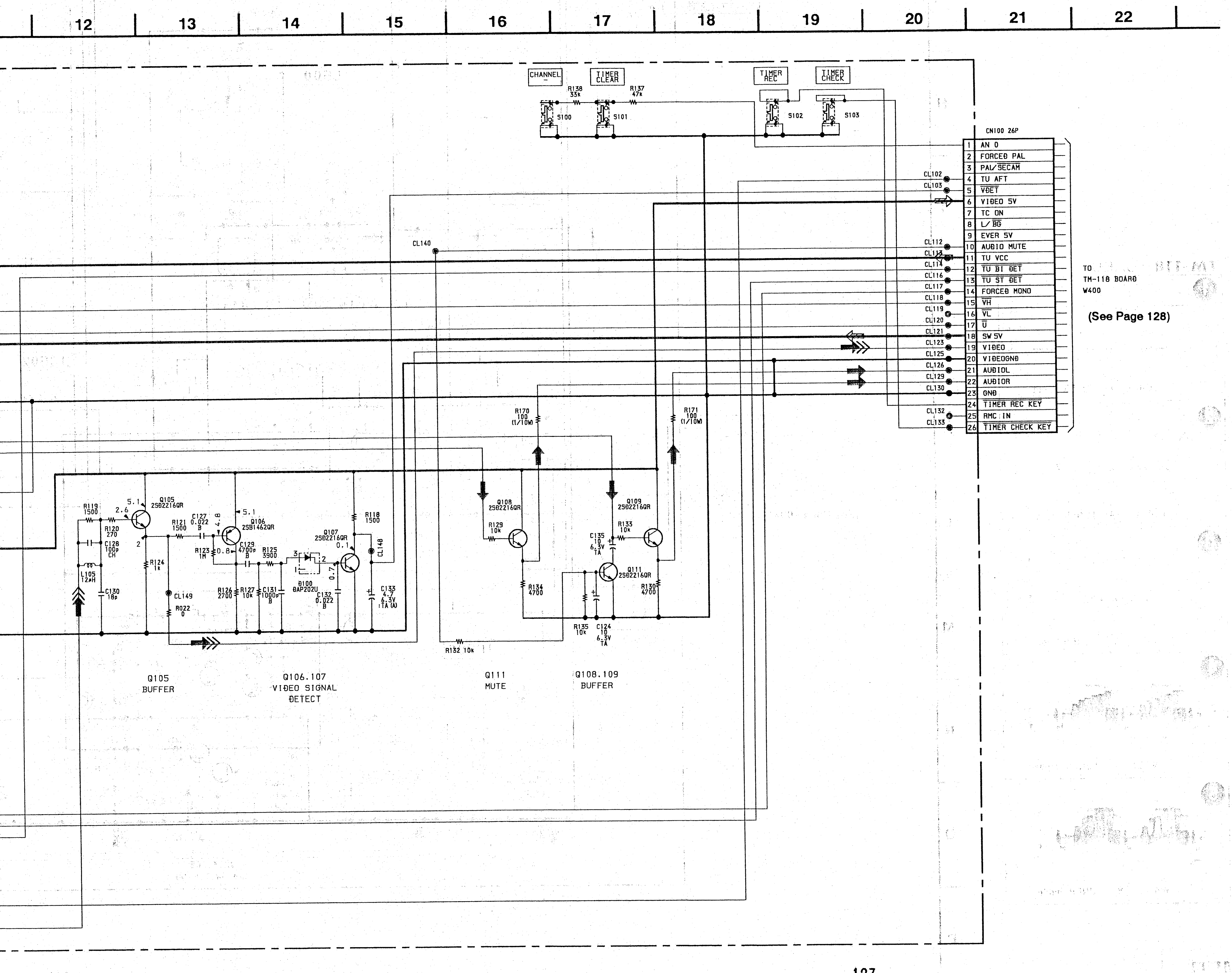

F
G
H
I
EXT ANT
ANTENNA
IF100
TIMER CLEAR
TIMER CHECK
TIMER REC
CHANNEL
1-645-416-
11
09
1
2
3
4
5
6
7
8
9
10
11

TU-142 (TUNER) SCHEMATIC DIAGRAM

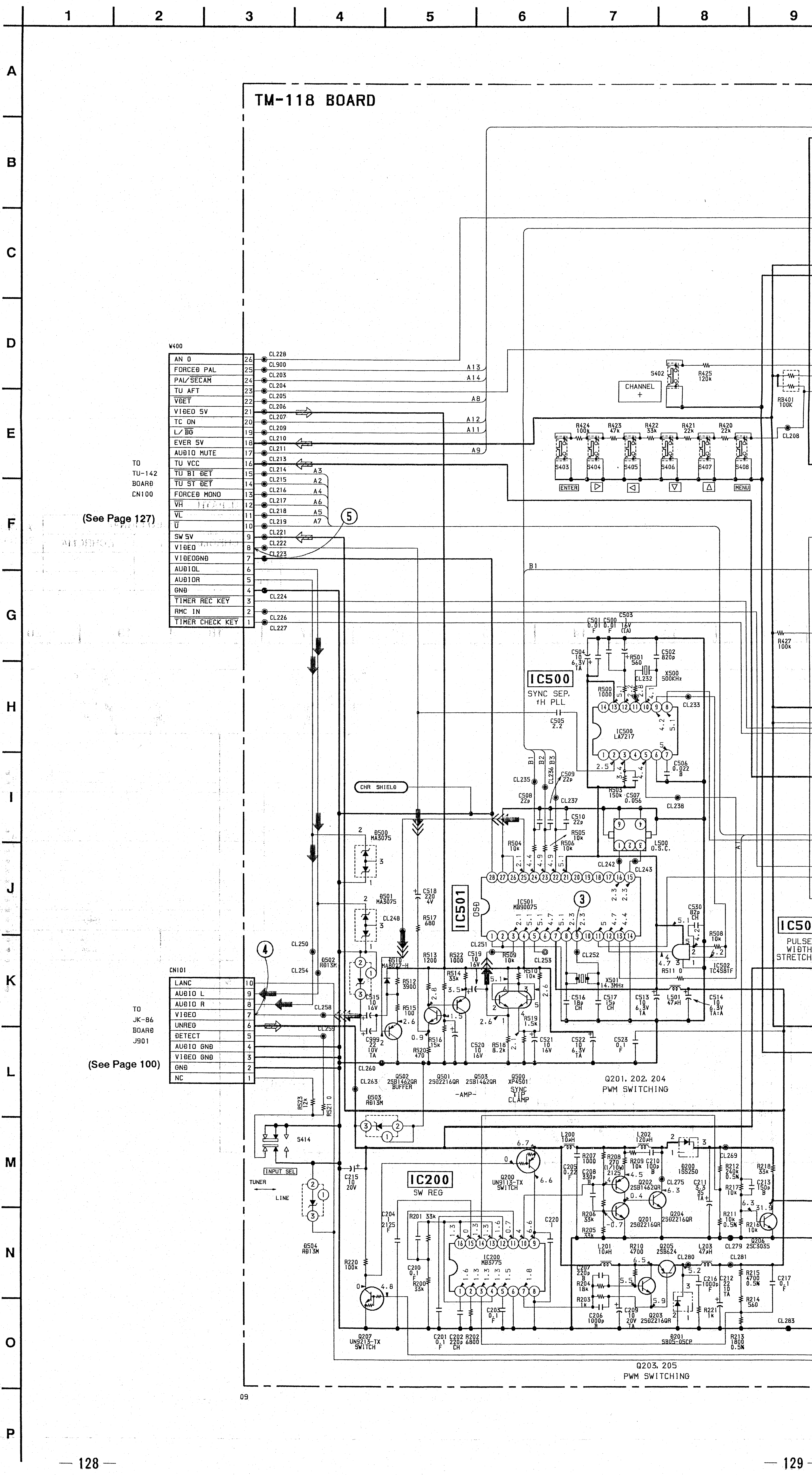

1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
TU-142 BOARD
no mark : TUNER mode
ROD ANTENNA
LNB100
ROD ANTENNA
C192 0.01 F
C139 0.01 F
R191 0
L102 2.7μH
J100
EXT ANT
CL124
CL122
CL127
C118 0.047 F
PS100 CCP2E20 0.8A
Q100, 102 BAND SWITCH
Q100 DTA143EE
Q102 DTA143EE
5.1
0.5
5
5.1
0
4.9
TU100 BT-HA301
ANT
U
AGC
VC
VH
VL
+B
IF
CL105
CL106
CL107
CL108
CL109
CL110
CL111
C110 0.047 F
C111 0.047 F
CL128
C112 10 6.3V TA W
C113 0.047 F
C115 0.047 F
C116 0.047 F
C117 10 6.3V TA W
R140 0
SOL100
CL115
C142 47 10V TA:B
TU SHIELD
R100 22k
R101 22k
C100 0.068 F:2125
C101 0.068 F:2125
CL100
R102 2200
R103 2200
R104 330k
1.7
0.6
C103 10 6.3V TA W
C104 33P CH
C102 0.068 F:2125
Q103 2SD2216QR
CL101
Q103 RIPPLE FILTER
L101 47μH
C190 10 6.3V TA:A
CL147
CL145
R115 0
R116 0
R114 7.5k
C141 0.01
CL143
C122 0.047 F
L104 47μH
C119 10 16V AL:3
C120 0.1 F
C121 0.1 F
IF100 IFJ-450L
GND
IF IN
IF AGC
AFT OUT
RF AGC
APC FILTER
VCC 1
VCC 2
VIDEO OUT
MPX OUT
L OUT
R OUT
SUB.LEB
ST.LEB
MODE
F MONO
MUTE
GND
CL141
CL142
CL144
CL137
CL138
CL139
R111 100k
R110 100k
C150 0.47 :2125
R109 1k
09

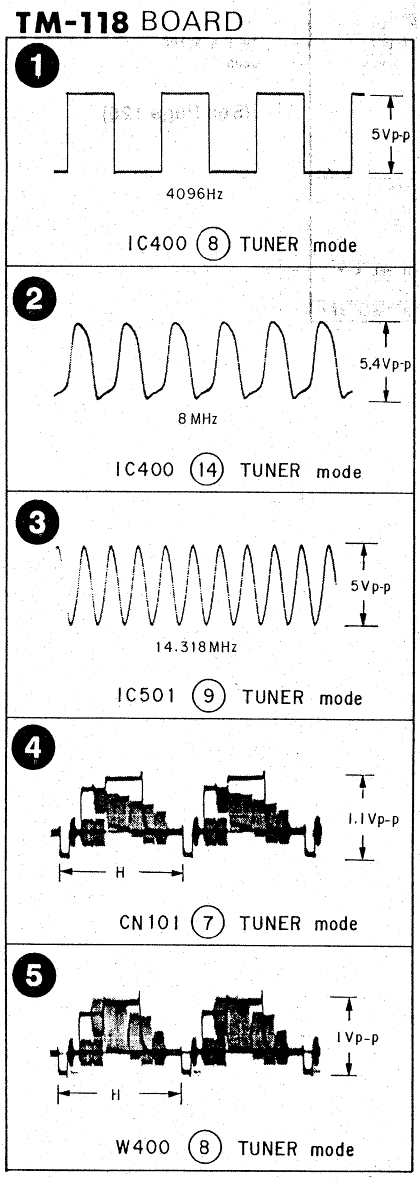
- **SIGNAL PATH**

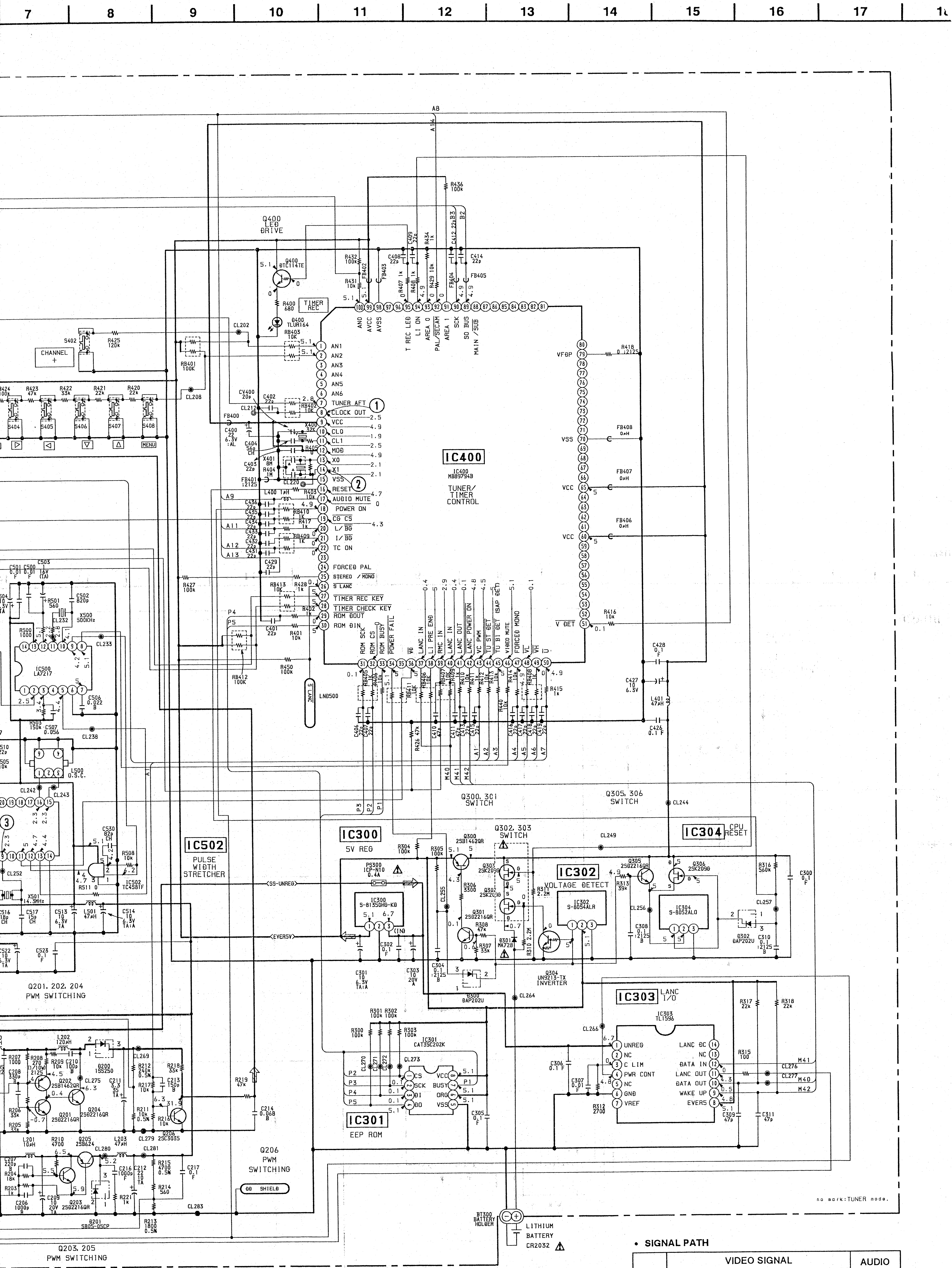
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	➡
PB				


12
13
14
15
16
17
18
19
20
21
22
CHANNEL –
TIMER CLEAR
TIMER REC
TIMER CHECK
R138 33k
R137 47k
S100
S101
S102
S103
CN100 26P
1 AN 0
2 FORCED PAL
3 PAL/SECAM
4 TU AFT
5 VDET
6 VIDEO 5V
7 TC ON
8 L/BG
9 EVER 5V
10 AUDIO MUTE
11 TU VCC
12 TU BI DET
13 TU ST DET
14 FORCED MONO
15 VH
16 VL
17 U
18 SW 5V
19 VIDEO
20 VIDEOGND
21 AUDIOL
22 AUDIOR
23 GND
24 TIMER REC KEY
25 RMC IN
26 TIMER CHECK KEY
CL102
CL103
CL112
CL113
CL114
CL116
CL117
CL118
CL119
CL120
CL121
CL123
CL125
CL126
CL129
CL130
CL132
CL133
CL140
CL148
CL149
TO
TM-118 BOARD
W400
(See Page 128)
R119 1500
R120 270
C128 100p CH
L105 12µH
C130 18p
5.1
2.6
2
Q105 2SD2216QR
R124 1k
R022 0
R121 1500
C127 0.022 B
4.8
5.1
Q106 2SB1462QR
R123 1M
0.8
C129 4700p B
R125 3900
R126 2700
R127 10k
C131 1000p B
3
2
1
D100 DAP202U
C132 0.022 B
0.7
0.1
Q107 2SD2216QR
R118 1500
C133 4.7 6.3V :TA (A)
Q105
BUFFER
Q106.107
VIDEO SIGNAL
DETECT
R170 100 (1/10W)
R171 100 (1/10W)
Q108 2SD2216QR
R129 10k
R134 4700
Q109 2SD2216QR
R133 10k
C135 10 6.3V TA
Q111 2SD2216QR
R130 4700
R135 10k
C124 10 6.3V TA
R132 10k
Q111
MUTE
Q108.109
BUFFER

TM-118 (TUNER/TIMER CONTROL) SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
TM-118 BOARD
W400
AN 0
FORCED PAL
PAL/SECAM
TU AFT
VDET
VIDEO 5V
TC ON
L/BG
EVER 5V
AUDIO MUTE
TU VCC
TU BI DET
TU ST DET
FORCED MONO
VH
VL
U
SW 5V
VIDEO
VIDEOGND
AUDIOL
AUDIOR
GND
TIMER REC KEY
RMC IN
TIMER CHECK KEY
TO TU-142 BOARD CN100
(See Page 127)
CN101
LANC
AUDIO L
AUDIO R
VIDEO
UNREG
DETECT
AUDIO GND
VIDEO GND
GND
NC
TO JK-86 BOARD J901
(See Page 100)
IC500
SYNC SEP. fH PLL
IC500 LA7217
IC501
OSD
IC501 MB90075
IC200
SW REG
IC200 MB3775
IC502 TC4S81F
PULSE WIDTH STRETCH
CHR SHIELD
CHANNEL +
ENTER
MENU
S402
S403
S404
S405
S406
S407
S408
S414
INPUT SEL
TUNER
LINE
Q502 2SB1462QR BUFFER
Q501 2SD2216QR
Q503 2SB1462QR
-AMP-
Q500 XP4501 SYNC TIP CLAMP
Q200 UN9113-TX SWITCH
Q207 UN9213-TX SWITCH
Q201, 202, 204 PWM SWITCHING
Q203, 205 PWM SWITCHING
X500 500kHz
X501 14.3MHz
L500 O.S.C.
D500 MA3075
D501 MA3075
D502 RD13M
D503 RD13M
D504 RD13M
D510 MA8027-H
09



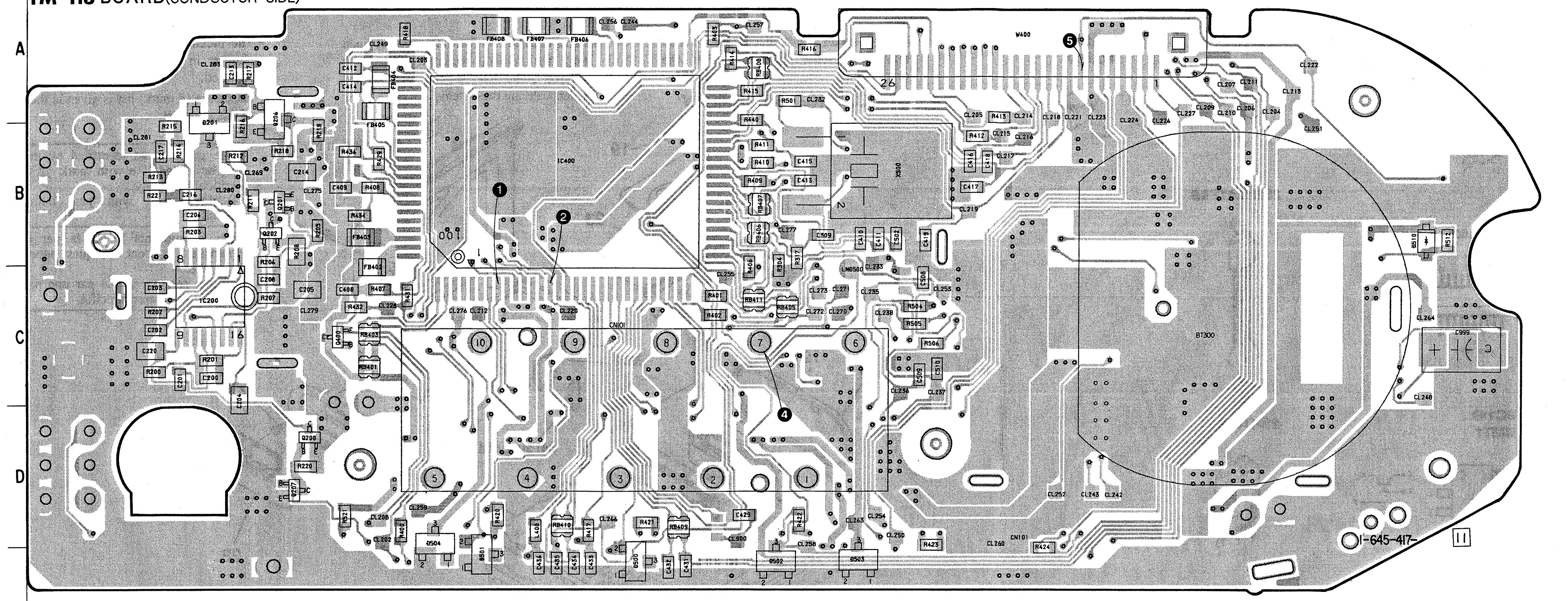

7
8
9
10
11
12
13
14
15
16
17
IC400
IC400 MB89794B
TUNER/ TIMER CONTROL
IC300
5V REG
IC300 S-81350HG-KD
IC301
EEP ROM
IC301 CAT35C202K
IC302
VOLTAGE DETECT
IC302 S-8054ALR
IC303
LANC I/O
IC303 TL1596
IC304
CPU RESET
IC304 S-8052ALO
IC500 LA7217
IC502
PULSE WIDTH STRETCHER
IC502 TC4S81F
Q400 LED DRIVE
Q400 DTC114TE
D400 TLUR164
TIMER REC
CHANNEL +
S402
S404
S405
S406
S407
S408
MENU
Q300, 301 SWITCH
Q302, 303 SWITCH
Q305, 306 SWITCH
Q304 UN9213-TX INVERTER
Q201, 202, 204 PWM SWITCHING
Q203, 205 PWM SWITCHING
Q206 PWM SWITCHING
DD SHIELD
BT300 BATTERY HOLDER
LITHIUM BATTERY CR2032
S LANC
LND500
<SS-UNREG>
<EVERSV>
AN1
AN2
AN3
AN4
AN5
AN6
TUNER AFT
CLOCK OUT
VCC
CL0
CL1
MOD
X0
X1
VSS
RESET
AUDIO MUTE
POWER ON
CG CS
L/BG
I/BG
TC ON
FORCED PAL
STEREO /MONO
S LANC
TIMER REC KEY
TIMER CHECK KEY
ROM DOUT
ROM DIN
ROM SCK
ROM CS
ROM BUSY
POWER FAIL
V6
LANC IN
LI PRE END
RMC IN
LANC IN
LANC OUT
LANC POWER ON
VC PWM
TU ST DET
TU BI DET (SAP DET)
VIDEO MUTE
FORCED MONO
VL
VH
U
ANO
AVCC
AVSS
T REC LED
LI ON
AREA 0
PAL/SECAM
AREA 1
SCK
SO BUS
MAIN /SUB
VFDP
VSS
VCC
VCC
V DET
CS
SCK
DI
DO
VCC
BUSY
ORG
VSS
UNREG
NC
C LIM
PWR CONT
NC
GND
VREF
LANC DC
NC
DATA IN
LANC OUT
DATA OUT
WAKE UP
EVERS
P1
P2
P3
P4
P5
M40
M41
M42
A1
A2
A3
A4
A5
A6
A7
A8
A9
A11
A12
A13
A14
no mark:TUNER mode.

• SIGNAL PATH

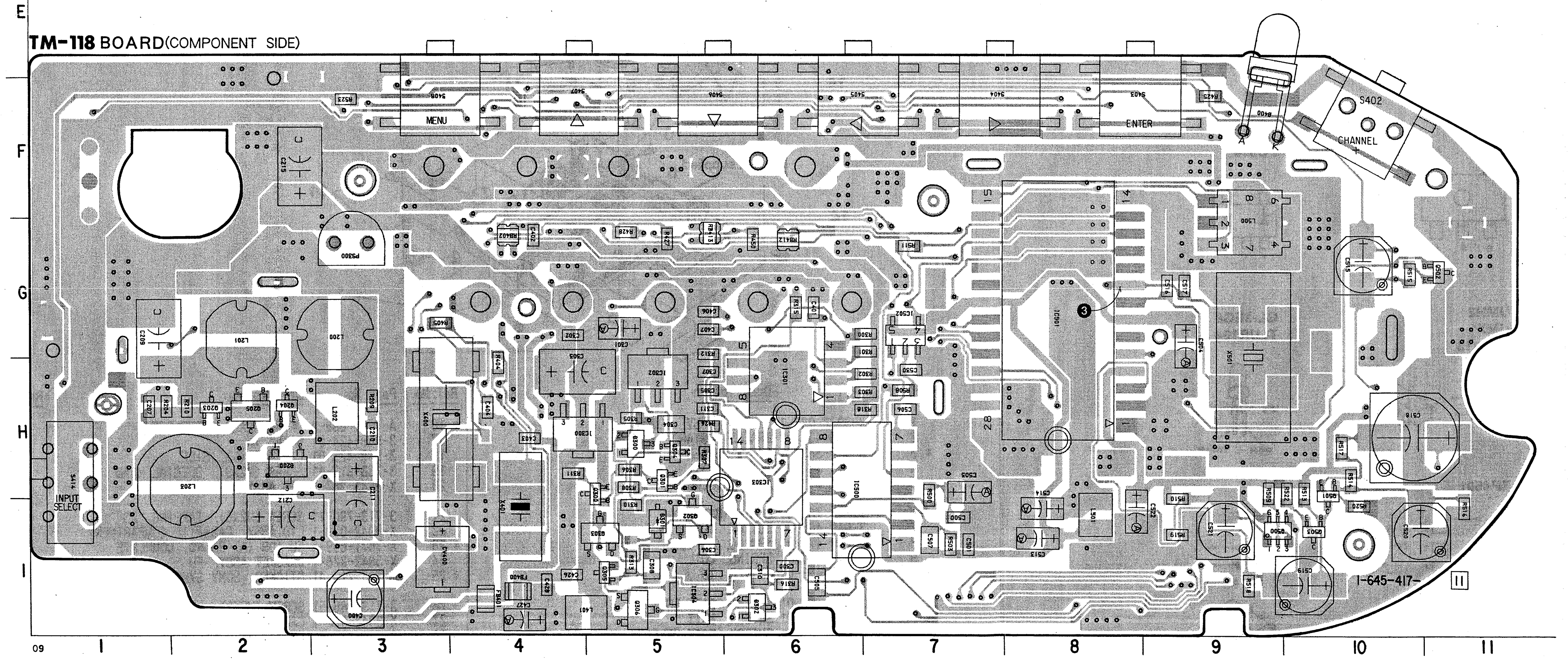
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	➡
PB				

TM-118 (TUNER/TIMER CONTROL) PRINTED WIRING BOARD

TM-118 BOARD(CONDUCTOR SIDE)



TM-118 BOARD(COMPONENT SIDE)



TM-118 BOARD

D200	H-2	Q200	D-2
D201	B-2	Q201	B-2
D300	H-5	Q202	B-2
D301	I-5	Q203	H-2
D302	I-6	Q204	H-2
D400	F-9	Q205	H-2
D500	E-5	Q206	A-2
D501	E-4	Q207	D-2
D502	E-6	Q300	I-5
D503	E-6	Q301	H-5
D504	D-3	Q302	I-5
D510	B-10	Q303	I-5
		Q304	H-5
IC200	C-2	Q305	I-5
IC300	H-4	Q306	I-5
IC301	H-6	Q400	C-3
IC302	H-5	Q500	I-9
IC303	H-6	Q501	I-10
IC304	I-5	Q502	G-11
IC400	B-4	Q503	I-10
IC500	H-6		
IC501	G-8		
IC502	G-7		

〈 DIODE 〉

D200	8-719-802-36	DIODE 1SS250
D201	8-719-938-75	DIODE SB05-05CP
D300	8-719-941-09	DIODE DAP202U
⚠D301	8-719-421-27	DIODE MA728
D302	8-719-941-09	DIODE DAP202U
D400	8-719-800-56	LED TLUR164
D500	8-719-420-81	DIODE MA3075WA
D501	8-719-420-81	DIODE MA3075WA
D502	8-719-106-80	DIODE RD13M-B2
D503	8-719-106-80	DIODE RD13M-B2
D504	8-719-106-80	DIODE RD13M-B2
D510	8-719-421-15	DIODE MA8027

〈 IC 〉

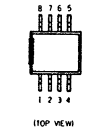
IC200	8-759-990-45	IC MB3775PFV
IC300	8-759-512-69	IC S-81350HG-KD
IC301	8-759-720-45	IC CAT35C202K
IC302	8-759-946-03	IC S-8054ALR-LN-S
IC303	8-759-999-02	IC TL1596CDB
IC304	8-759-940-33	IC S-8052ALO-LG-S
IC400	8-759-083-08	IC MB89794BPF-177
IC500	8-759-083-11	IC LA7217M
IC501	8-759-098-47	IC MB90075PF-122
IC502	8-759-209-97	IC TC4S81F

〈 TRANSISTOR 〉

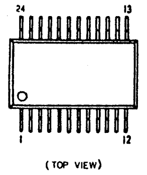
Q200	8-729-428-88	TRANSISTOR UN9113
Q201	8-729-425-64	TRANSISTOR 2SD2216Q
Q202	8-729-425-50	TRANSISTOR 2SB1462Q
Q203	8-729-425-64	TRANSISTOR 2SD2216Q
Q204	8-729-425-64	TRANSISTOR 2SD2216Q
Q205	8-729-141-48	TRANSISTOR 2SB624-BV345
Q206	8-729-601-58	TRANSISTOR 2SC3053-C
Q207	8-729-429-18	TRANSISTOR UN9213
Q300	8-729-425-50	TRANSISTOR 2SB1462Q
Q301	8-729-425-64	TRANSISTOR 2SD2216Q
⚠Q302	8-729-220-93	TRANSISTOR 2SK209-G
⚠Q303	8-729-220-93	TRANSISTOR 2SK209-G
Q304	8-729-429-18	TRANSISTOR UN9213
Q305	8-729-425-64	TRANSISTOR 2SD2216Q
Q306	8-729-220-93	TRANSISTOR 2SK209-G
Q400	8-729-929-26	TRANSISTOR DTC114TE
Q500	8-729-427-72	TRANSISTOR XP4501
Q501	8-729-425-64	TRANSISTOR 2SD2216Q
Q502	8-729-425-50	TRANSISTOR 2SB1462Q
Q503	8-729-425-50	TRANSISTOR 2SB1462Q

4-3. SEMICONDUCTOR

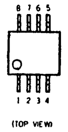
AK6420F



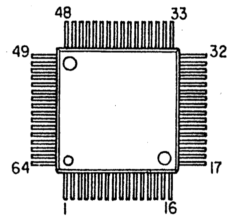
BA3570FS
LB8111V



CAT35C202K
CXA1211M
NJM2073M



CXA1207AR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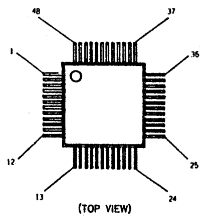
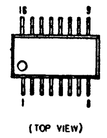
64
17
1
16

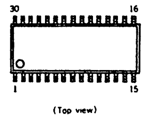
CXA1208R



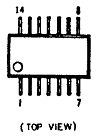
CXA1452N
CXD2107M
MB3775PFV
MC10H116M
XRU4052BF



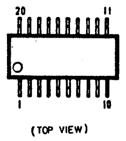
CXA8006M



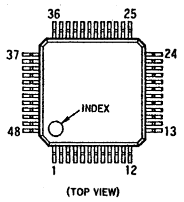
CXL5502M
LA7217M
TL1596CDB



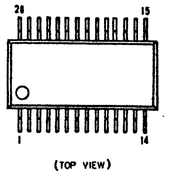
M62352GP
MPC1720M



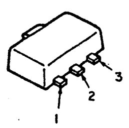
MB3785APFV-G-BND-ER


36
25
37
24
INDEX
48
13
1
12
(TOP VIEW)

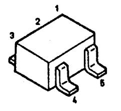
MB90075PF



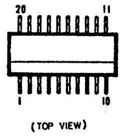
S-8053ALO-LG-S
S-8054ALR-LN-S
S-81350HG-KD



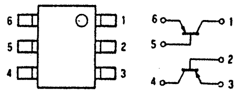
TC4S11F
TC4S66F
TC4S81F



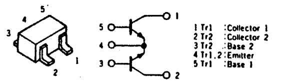
µPD6453GT-622



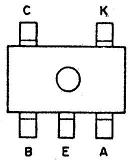
FC149
UMT1



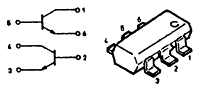
FMG4


1 Tr1 :Collector 1
2 Tr2 :Collector 2
3 Tr2 :Base 2
4 Tr1,2 :Emitter
5 Tr1 :Base 1

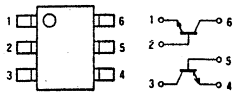
FP102



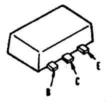
UMH2
UMX1
XN4213



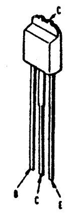
XP4501



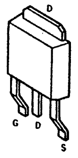
2SB1121



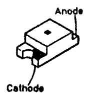
2SB1202FAS



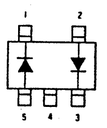
2SK1469



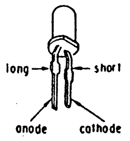
BR1102W


Anode
Cathode

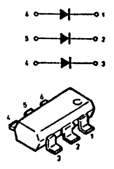
FC806



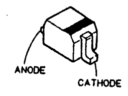
GL-3EG8
TLUR164


long
short
anode
cathode

IMN10



MA8027
MA8091


ANODE
CATHODE

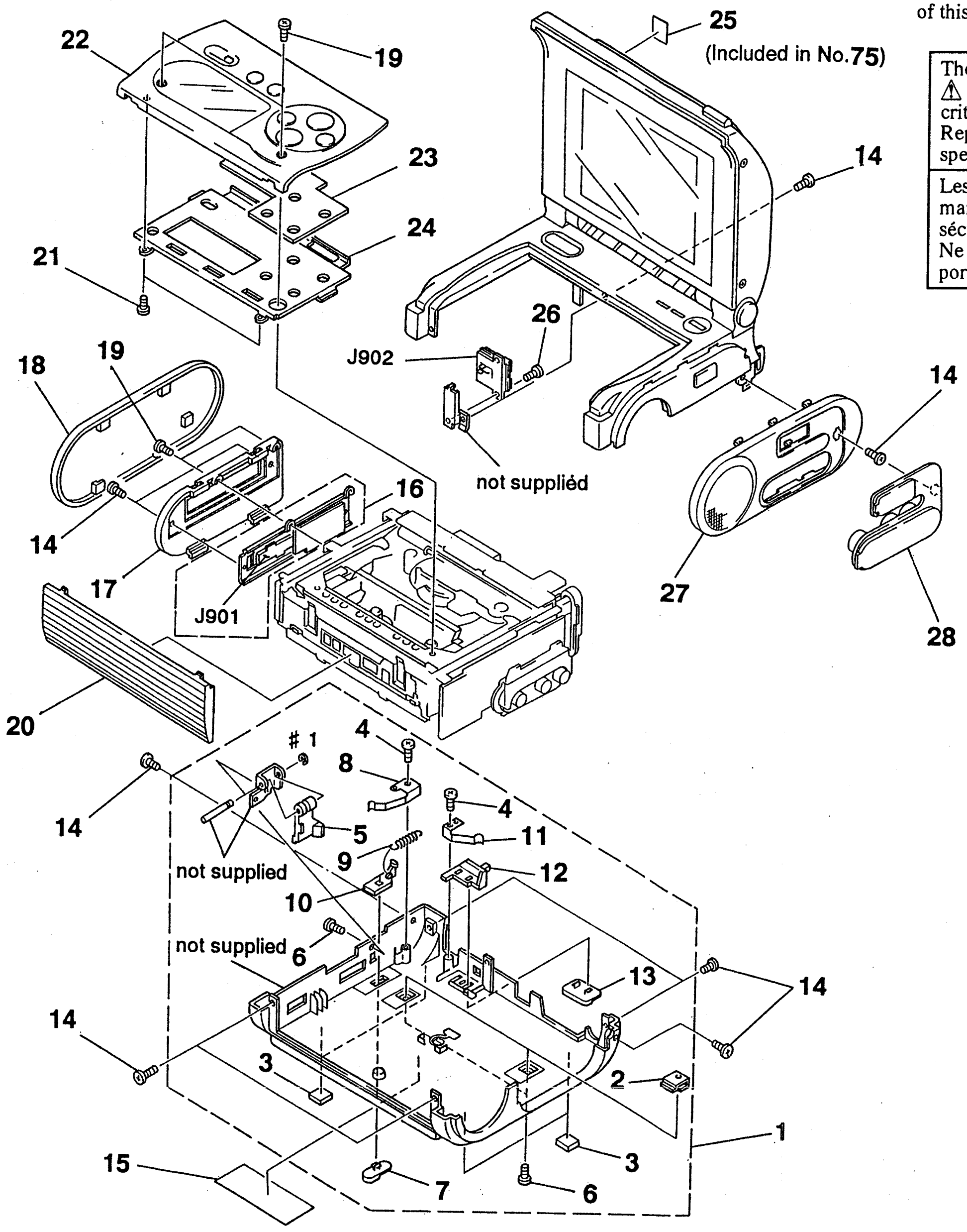
SECTION 5
EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

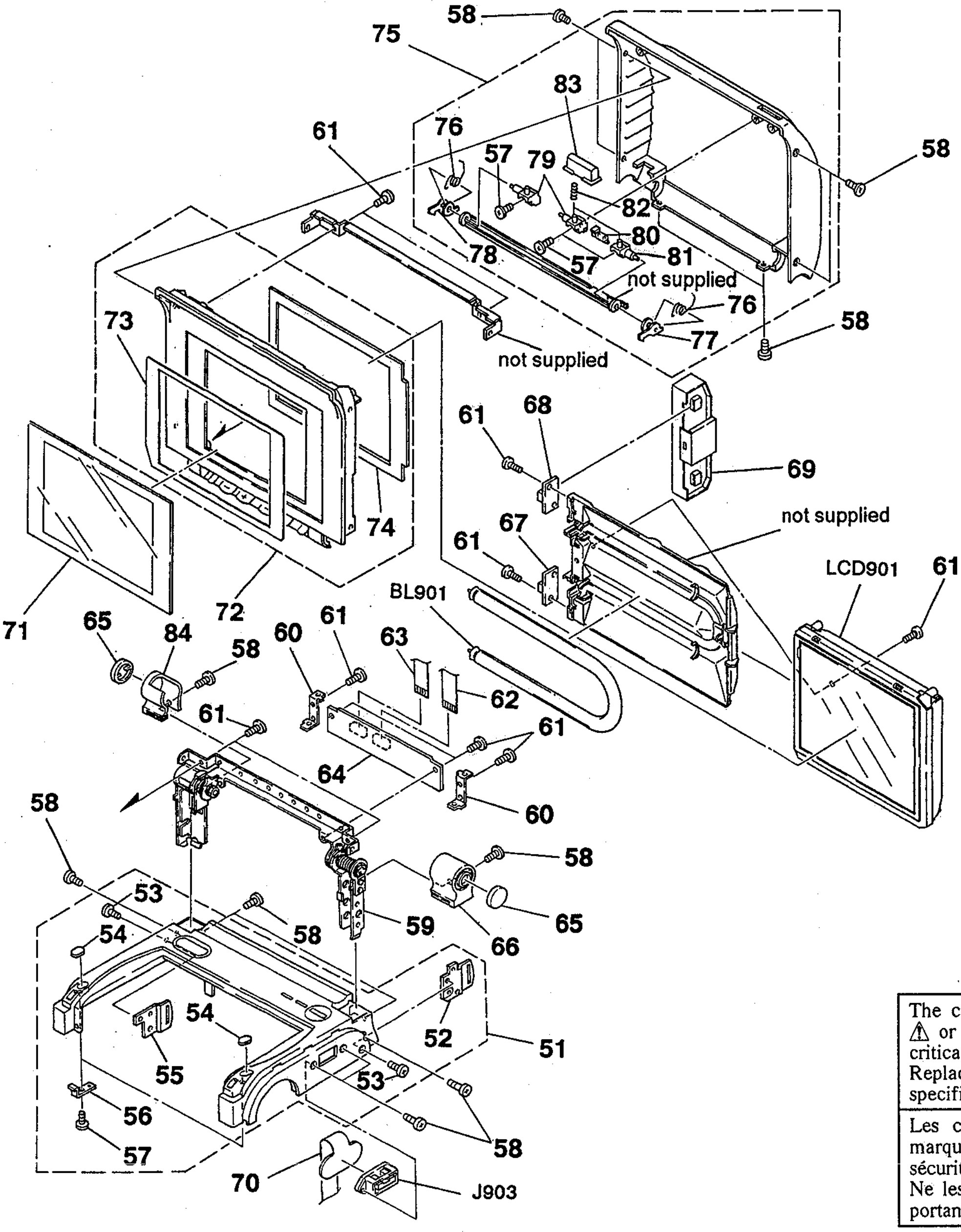
5-1. CABINET ASSEMBLY


22
19
23
24
21
25
(Included in No.75)
14
26
J902
not suppliéd
18
19
16
14
17
J901
14
27
28
20
#1
4
8
4
11
5
12
9
14
not supplied
10
not supplied
6
13
14
14
3
2
1
15
7
3
6

Ref. No.	Part No.	Description	Remark
1	X-3942-026-1	CABINET ASSY, LOWER	
2	3-736-496-01	BRACKET, STAND	
* 3	3-949-383-01	FOOT, RUBBER	
4	3-945-884-01	SCREW (2X5)	
5	3-949-471-01	KNOB, TU LOCK	
6	3-713-786-81	SCREW (M2X2.5)	
7	3-949-465-01	BUTTON, TU RELEASE	
* 8	3-949-472-01	SPRING, TU LOCK	
9	3-949-470-01	SPRING, COIL	
* 10	3-949-473-01	SLIDER, TU	
* 11	3-949-469-01	SPRING, BATT LOCK	
* 12	3-949-468-01	SLIDER, BATT	
13	3-949-467-01	BUTTON, BATT RELEASE	
14	3-719-381-01	SCREW (M2X4)	
* 15	3-949-754-01	LABEL, MODEL NUMBER (U)	

Ref. No.	Part No.	Description	Remark
* 16	A-7071-698-A	JK-86 BOARD, COMPLETE	
17	3-949-424-01	RAIL, TU	
18	3-949-425-01	CABINET (L), SIDE	
19	3-733-912-41	SCREW (M2X9), SPECIAL HEAD	
20	X-3941-982-1	LID ASSY, LS	
21	3-713-790-11	SCREW (M2X5), TAPPING, P3	
22	X-3942-029-1	LID ASSY, CASSETTE COMPARTMENT	
* 23	A-7071-699-A	FU-109 (A) BOARD, COMPLETE	
24	X-3942-225-1	BRACKET ASSY, FU	
* 25	3-703-713-41	STICKER, SONY SYMBOL (10)	
26	3-713-786-51	SCREW (M2X3)	
27	X-3942-022-1	CABINET (R) ASSY, SIDE	
28	3-949-422-01	COVER, JACK	
J901	1-537-449-11	TERMINAL BOARD (TUNER/CAMERA)	
J902	1-537-420-21	TERMINAL BOARD (BATTERY)	

5-2. UPPER CABINET AND SC BLOCK ASSEMBLIES

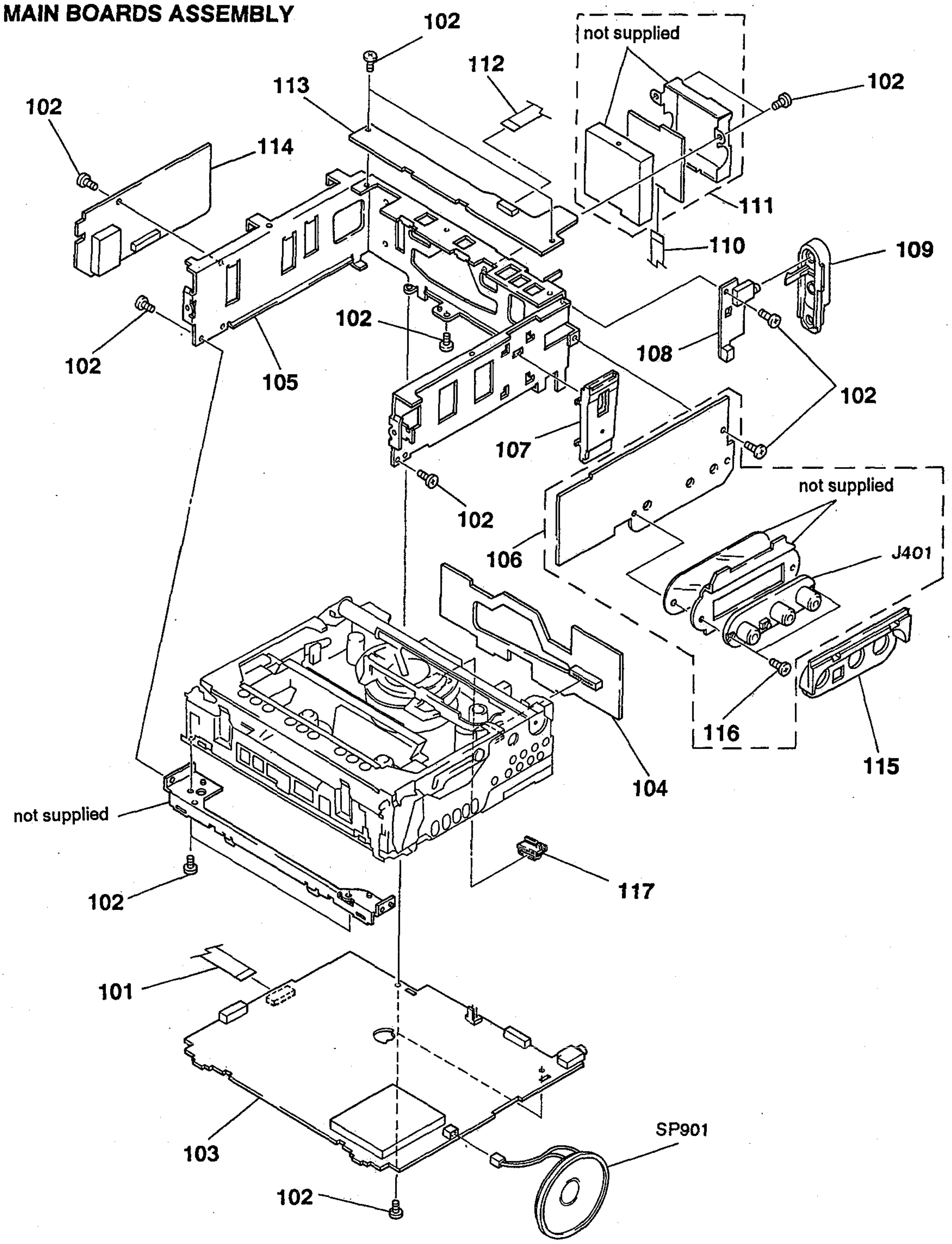

58
75
83
61
76
57
79
58
82
80
78
81
57
not supplied
76
73
77
58
not supplied
61
68
69
74
67
61
not supplied
LCD901
61
BL901
71
65
84
72
58
60
61
63
62
61
61
64
58
60
58
53
65
54
58
59
66
54
52
51
55
53
56
58
57
70
J903

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
51	X-3942-036-1	CABINET ASSY, UPPER	
52	3-949-461-01	BRACKET (R), STRAP	
53	3-713-786-81	SCREW (M2X2.5)	
54	3-949-464-01	CUSHION	
55	3-949-462-01	BRACKET (L), STRAP	
56	3-949-487-01	PLATE, LOCK	
57	3-945-884-01	SCREW (2X5)	
58	3-719-381-01	SCREW (M2X4)	
59	X-3941-986-1	FRAME ASSY, HINGE	
* 60	3-949-409-01	REINFORCEMENT, HINGE	
61	3-713-790-11	SCREW (M2X5), TAPPING, P3	
62	1-645-364-11	FP-563 FLEXIBLE BOARD	
63	1-645-368-11	FP-568 FLEXIBLE BOARD	
* 64	A-7071-700-A	VR-39 (A) BOARD, COMPLETE	
65	3-949-411-01	CAP	
66	3-949-406-01	COVER, R	
* 67	A-7071-714-A	LA-23 BOARD, COMPLETE	
* 68	A-7071-713-A	LA-22 BOARD, COMPLETE	
⚠69	1-466-791-11	INVERTER UNIT, DC/AC (DPS-28)	
70	1-645-369-11	FP-621 FLEXIBLE BOARD	
71	3-949-413-01	WINDOW, SC	
72	X-3942-035-1	CABINET ASSY, LOWER, SC	
73	3-949-408-01	SHEET, ADHESIVE, SC WINDOW	
74	3-949-414-01	SHEET, DUST PROTECTION	
75	X-3942-034-1	CABINET ASSY, UPPER, SC	
76	3-949-426-01	SPRING, LOCK	
* 77	3-949-415-01	ARM (R), LOCK	
* 78	3-949-419-01	ARM (L), LOCK	
79	3-949-430-01	FULCRUM BLOCK (B)	
80	3-949-428-01	PLATE, SLIDE, LOCK	
81	3-949-427-01	FULCRUM BLOCK (A)	
82	3-944-333-01	SPRING, COMPRESSION	
83	3-949-417-01	BUTTON, RELEASE	
84	3-949-412-01	COVER, L	
BL901	1-517-126-11	FLUORESENT TUBE, HEAT CATHODE	
J903	1-580-009-21	SOCKET, CONNECTOR (SQUARE) 12P (A/V OUT)	
LCD901	1-809-500-11	MODULE, COLOR LIQUID CRYSTAL	

5-3. MAIN BOARDS ASSEMBLY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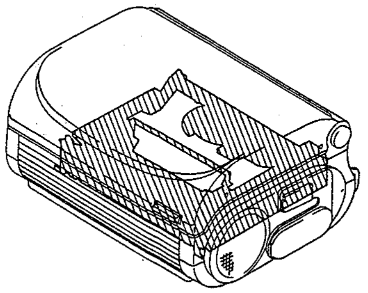
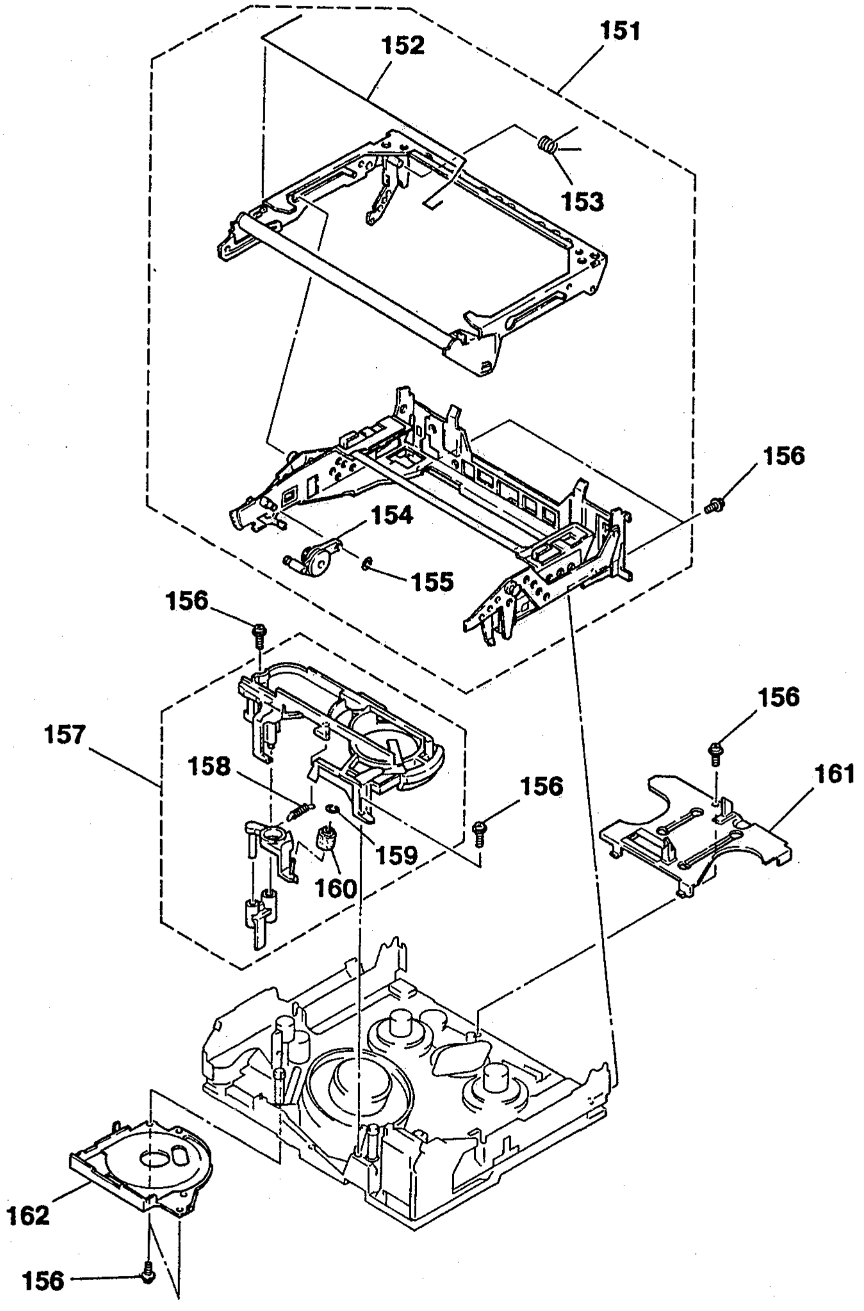
Ref. No.	Part No.	Description	Remark
101	1-645-995-11	FP-629 FLEXIBLE BOARD	
102	3-713-786-51	SCREW (M2X3)	
103	A-7053-386-A	MA-137 (B) BOARD, COMPLETE	
* 104	A-7063-329-A	SL-26 BOARD, COMPLETE	
105	X-3942-265-1	FRAME ASSY	
106	A-7053-385-A	AU-136 (B) BOARD, COMPLETE	
* 107	3-949-443-01	HOLDER, FLEXIBLE	
* 108	A-7071-696-A	HP-84 (A) BOARD, COMPLETE	
109	3-949-407-11	CAP, HP	
110	1-645-367-11	FP-566 FLEXIBLE BOARD	

Ref. No.	Part No.	Description	Remark
111	A-7063-328-A	RP-144 BOARD, COMPLETE	
112	1-645-366-11	FP-565 FLEXIBLE BOARD	
* 113	A-7071-697-A	PE-13 BOARD, COMPLETE	
114	A-7053-327-A	RG-25 (A) BOARD, COMPLETE	
115	3-949-442-01	PLATE, JACK	
116	3-719-381-01	SCREW (M2X4)	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
J401	1-569-556-11	JACK (VIDEO/AUDIO)	
SP901	1-504-137-11	SPEAKER (3.6CM)	

5-4. CASSETTE COMPARTMENT ASSEMBLY

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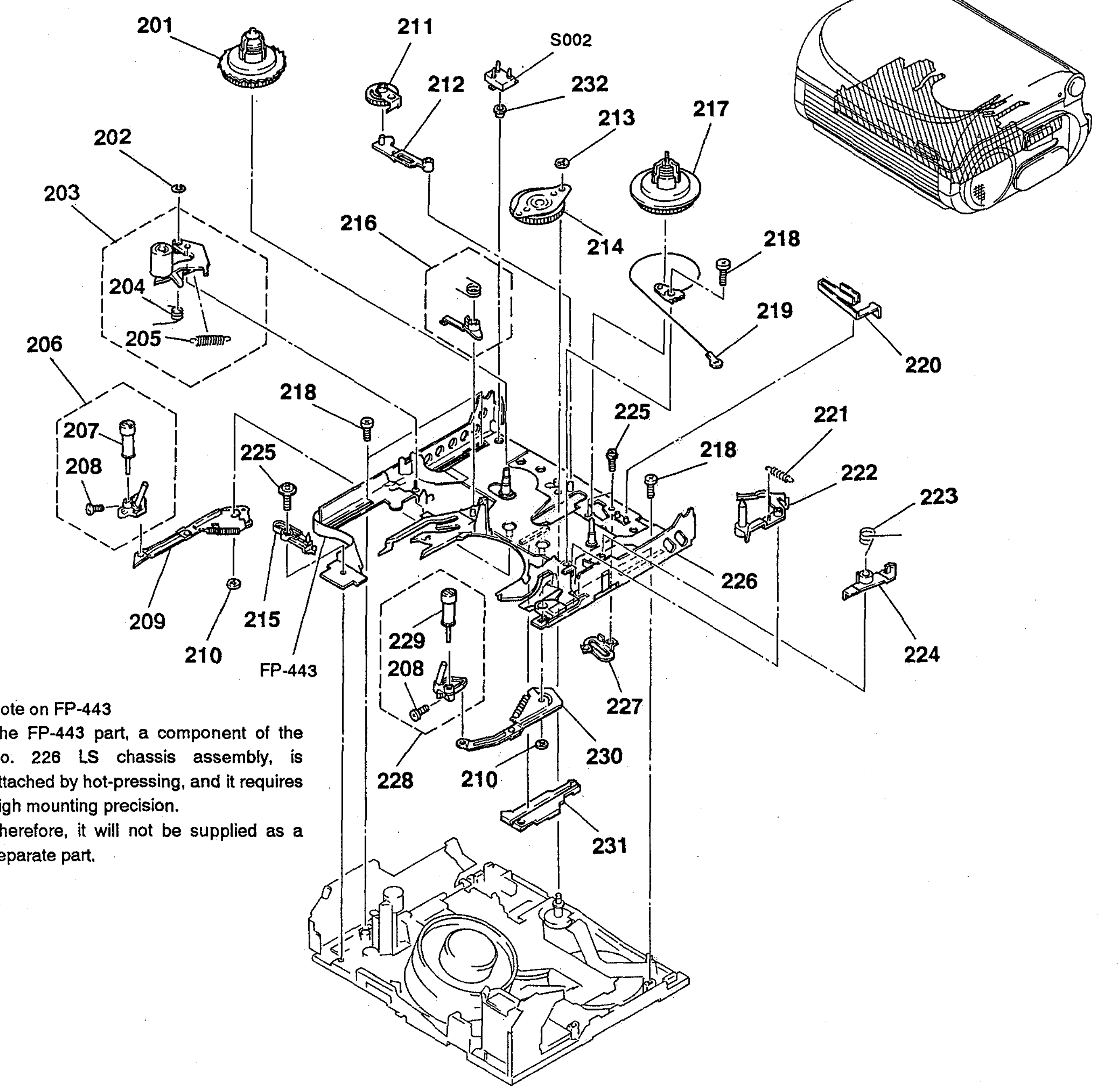
Ref. No.	Part No.	Description	Remark
151	A-7040-312-A	CASSETTE COMPARTMENT BLOCKASSY	
152	3-945-773-01	BAR, TORSION	
153	3-945-771-01	SPRING, TORSION	
154	X-3941-287-2	DAMPER ASSY	
155	3-315-384-31	WASHER, STOPPER	
156	3-947-503-01	SCREW (M1. 4X2. 5)	
157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
158	3-945-760-01	SPRING, TENSION	
159	3-321-393-01	WASHER, STOPPER	
160	X-3726-817-3	ROLLER ASSY, HC	
161	X-3941-280-1	RETAINER ASSY, GOOSENECK	
162	3-945-733-01	COVER, CAPSTAN	

5-5. LS CHASSIS ASSEMBLY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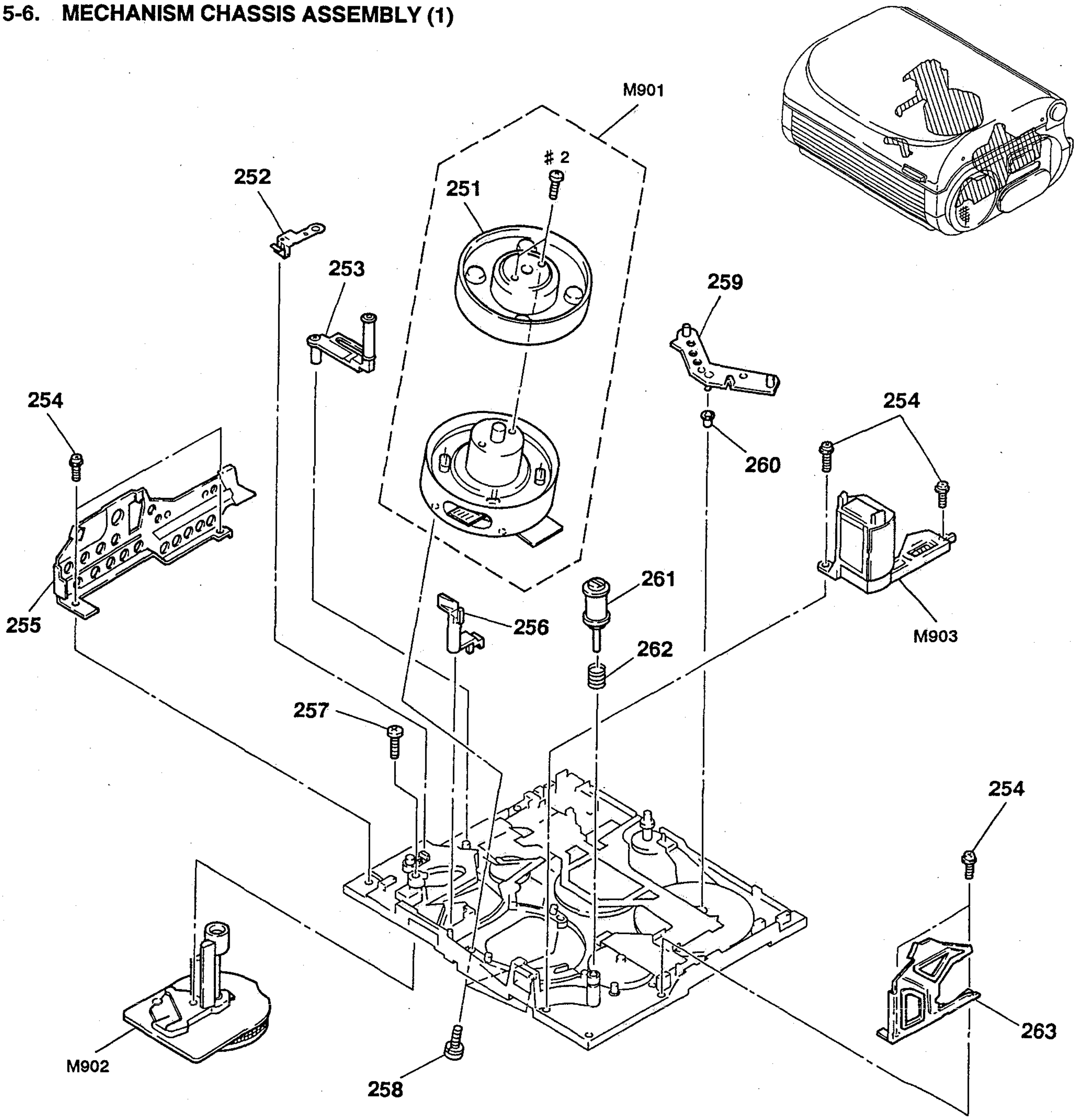
Note on FP-443
The FP-443 part, a component of the No. 226 LS chassis assembly, is attached by hot-pressing, and it requires high mounting precision.
Therefore, it will not be supplied as a separate part.

Ref. No.	Part No.	Description	Remark
201	X-3941-274-1	TABLE ASSY, REEL, T	
202	3-331-007-21	WASHER	
203	X-3941-271-1	ARM ASSY, PINCH	
204	3-945-743-01	SPRING, TORSION	
205	3-945-783-01	SPRING, TENSION	
206	A-7040-322-A	GUIDE (BASE) (T) BLOCK ASSY (2)	
207	X-3941-756-1	ROLLER ASSY (2), TG6	
208	3-947-504-01	SCREW (M1.2X2)	
209	X-3941-267-1	ARM (T) ASSY, GUIDE	
210	3-669-465-00	WASHER (1.5) STOPPER	
211	X-3941-273-1	SOFT ASSY, T	
212	3-945-753-01	ARM, T SOFT	
213	3-726-829-01	WASHER, STOPPER	
214	X-3941-279-1	GEAR ASSY, GOOSENECK	
215	3-947-644-01	RETAINER, TG5 (BASE)	
216	A-7040-321-A	CLAW BLOCK ASSY, T HARD	
217	X-3941-275-1	TABLE ASSY, REEL, S	
218	3-945-756-01	SCREW (M1.4X3)	
219	X-3941-277-1	STRING BLOCK ASSY	
220	3-945-801-01	BRAKE, S SOFT	
221	3-948-810-01	SPRING, TENSION	
222	X-3941-276-1	TG1 ASSY	
223	3-945-752-01	SPRING, TORSION	
224	3-945-799-01	BRAKE, S HARD	
225	3-947-503-01	SCREW (M1.4X2.5)	
226	X-3941-265-1	CHASSIS ASSY, LS	
227	3-945-784-01	PLATE, CAM, LS	
228	A-7040-323-A	GUIDE (BASE) (S) BLOCK ASSY (2)	
229	X-3941-755-1	ROLLER ASSY (2), TG3	
230	X-3941-266-1	ARM (S) ASSY, GUIDE	
231	3-945-837-01	SLIDER, GL	
232	3-949-881-01	SLEEVE	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	

5-6. MECHANISM CHASSIS ASSEMBLY (1)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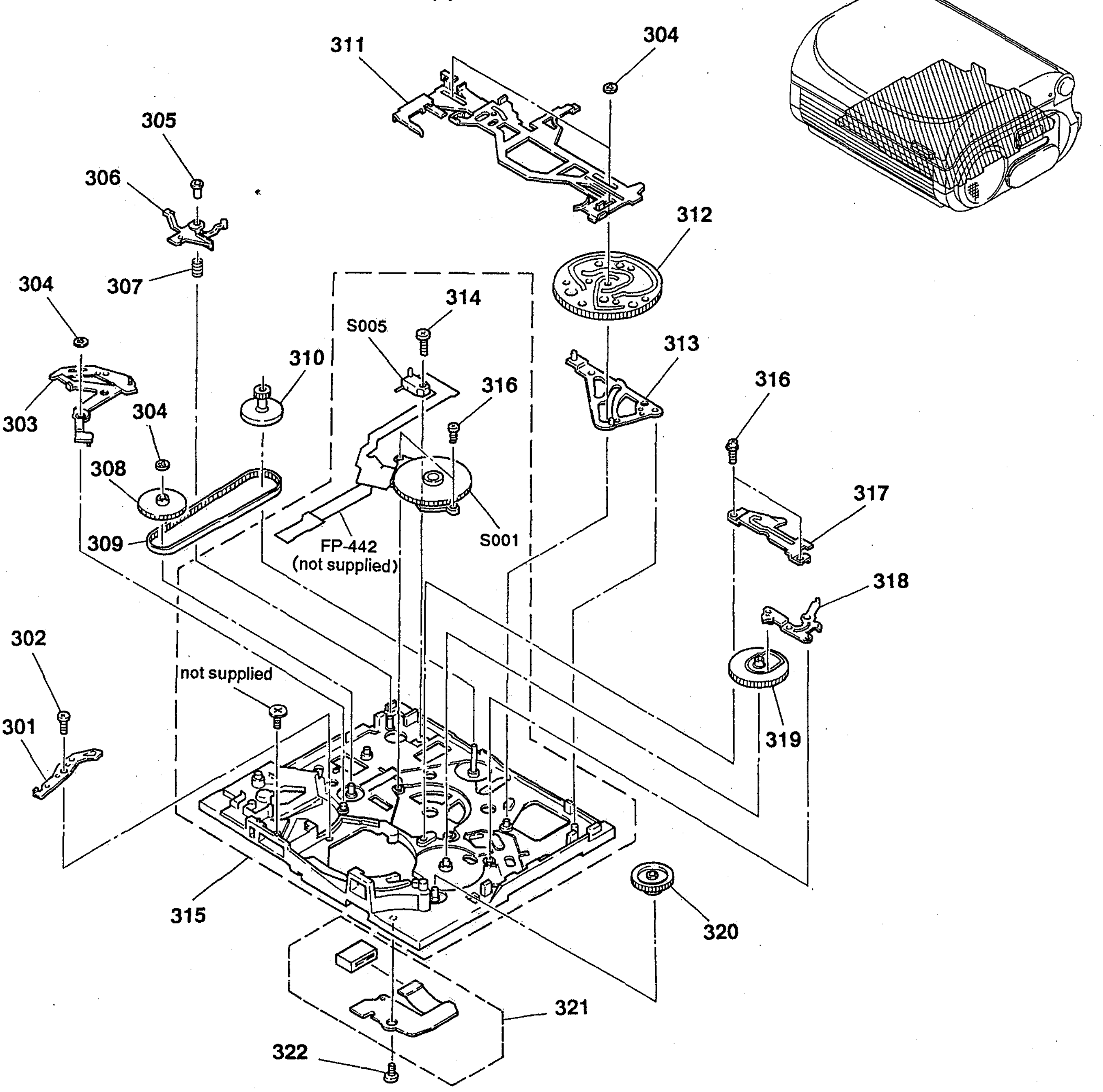
Ref. No.	Part No.	Description	Remark
251	A-7049-568-A	DRUM ASSY, UPPER (DGR-93-R)	
252	3-945-822-01	SPRING, LEAF, TG7 ARM	
253	A-7040-305-A	ARM BLOCK ASSY, TG7	
254	3-947-503-01	SCREW (M1. 4X2. 5)	
255	X-3941-255-1	PLATE (T) ASSY, SIDE	
256	3-945-735-01	ARM, HC CONVERSION	
257	3-713-786-71	SCREW (M2X5)	
258	3-686-493-01	SCREW (M2X5), P1	
259	3-945-701-01	ARM, LS	
260	3-945-702-01	ROLLER, LS	
261	X-3941-193-1	ROLLER ASSY (2), TG2	
262	3-945-774-01	SPRING, COMPRESSION	
263	3-945-691-01	PLATE (S), SIDE	
M901	A-7048-635-A	DRUM ASSY (DGH-93A-R)	
M902	8-835-492-01	MOTOR, DC SCE-0102A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)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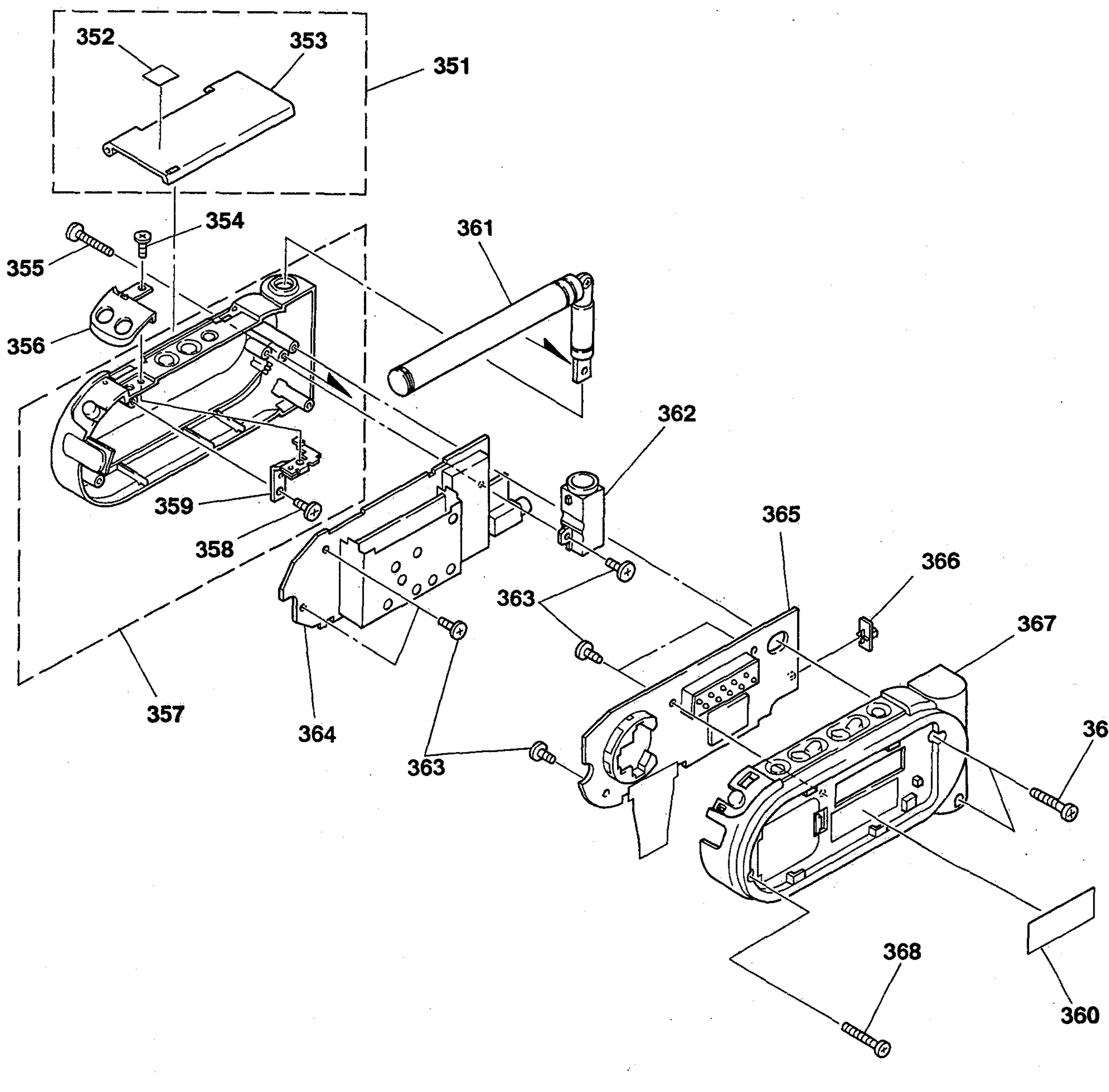
Ref. No.	Part No.	Description	Remark
301	3-945-734-01	ARM, HC DRIVING	
302	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
303	X-3941-259-1	ARM ASSY, PINCH PRESS	
304	3-726-829-01	WASHER, STOPPER	
305	3-945-730-01	SLEEVE, EJECT	
306	3-945-706-01	LEVER, EJECT	
307	3-945-729-01	SPRING, COMPRESSION	
308	X-3941-256-1	GEAR ASSY, CHANGE	
309	3-944-539-01	BELT, RELAY	
310	3-945-695-01	PULLEY, RELAY	
311	X-3941-260-1	SLIDER ASSY, M	
312	3-945-696-01	CAM	
313	X-3941-258-1	ARM ASSY, GL	
314	3-713-786-71	SCREW (M2X5)	
315	A-7040-303-A	CHASSIS ASSY, MECHANICAL	
316	3-947-503-01	SCREW (M1.4X2.5)	
317	3-945-722-01	RETAINER, GEAR	
318	X-3941-257-1	ARM ASSY, FF	
319	3-945-697-01	GEAR (B), L	
320	3-945-700-01	GEAR (A), L	
321	A-7040-311-A	FP-444 ASSY	
322	3-945-756-01	SCREW (M1.4X3)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH (C DOWN)	

5-8. TUNER/TIMER UNIT ASSEMBLY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Ref. No.	Part No.	Description	Remark
351	X-3942-226-1	DOOR ASSY, BUTTON	
* 352	3-703-713-41	STICKER, SONY SYMBOL (10)	
353	3-949-503-01	DOOR, BUTTON	
354	3-719-381-01	SCREW (M2X4)	
355	3-740-546-01	SCREW (M2X10)	
356	X-3942-048-1	PANEL ASSY, FRONT	
357	X-3942-047-1	CABINET (L) ASSY	
358	3-713-786-21	SCREW (M2X3)	
359	X-3942-163-1	NUT ASSY, PLATE	
* 360	3-949-752-01	LABEL, MODEL NUMBER	
361	1-501-456-11	ANTENNA, TELESCOPIC	
* 362	3-949-513-01	HOLDER, ANTENNA	
363	3-713-790-11	SCREW (M2X5), TAPPING, P3	
364	A-7063-380-A	TU-142 (B) BOARD, COMPLETE	
365	A-7063-381-A	TM-118 (B) BOARD, COMPLETE	
366	3-949-512-01	BUTTON, INPUT SELECTION	
367	X-3942-046-1	CABINET (R) ASSY	
368	3-713-790-31	SCREW (M2X8), TAPPING, P3	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Hardware (# mark) list is given in the last of this parts list.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description				Remark
*	A-7053-385-A	AU-136 BOARD, COMPLETE *********************				
	3-719-381-01	SCREW (M2X4)				
		(CAPACITOR)				
C052	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C053	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C054	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C055	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C056	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C057	1-135-177-21	TANTALUM CHIP	1uF	20%	20V	
C058	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C059	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C060	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C061	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C062	1-164-346-11	CERAMIC CHIP	1uF		16V	
C063	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C064	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C065	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C066	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C067	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	
C068	1-135-156-21	TANTALUM CHIP	6.8uF	10%	10V	
C069	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C070	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C071	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C072	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C073	1-164-346-11	CERAMIC CHIP	1uF		16V	
C074	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C401	1-124-778-00	ELECT CHIP	22uF	20%	6.3V	
C404	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C405	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C406	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C407	1-162-971-11	CERAMIC CHIP	0.001uF		50V	
C410	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C411	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C412	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C413	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C414	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C415	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C416	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C420	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C421	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C422	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V	
C423	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C424	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C425	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C426	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C427	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C428	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C429	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V	
C430	1-126-207-11	ELECT CHIP	33uF	20%	4V	
C431	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C432	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C433	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C434	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C435	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C436	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C437	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C438	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C439	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C440	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C441	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V	
C442	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C443	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C444	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C445	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C446	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C447	1-135-177-21	TANTALUM CHIP	1uF	20%	20V	
C448	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C449	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C450	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C451	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C452	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C453	1-135-177-21	TANTALUM CHIP	1uF	20%	20V	
C454	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C455	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C456	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C470	1-164-346-11	CERAMIC CHIP	1uF		16V	
C471	1-164-346-11	CERAMIC CHIP	1uF		16V	
C472	1-164-346-11	CERAMIC CHIP	1uF		16V	
C473	1-164-346-11	CERAMIC CHIP	1uF		16V	
C477	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C478	1-164-505-11	CERAMIC CHIP	2.2uF		16V	
C479	1-164-505-11	CERAMIC CHIP	2.2uF		16V	
C488	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C489	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	

Ref. No.	Part No.	Description				Remark
C491	1-164-346-11	CERAMIC CHIP	1uF		16V	
C492	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C493	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C494	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C495	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C496	1-135-211-11	TANTAL. CHIP	6.8uF	20%	6.3V	
C497	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C498	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C501	1-164-346-11	CERAMIC CHIP	1uF		16V	
C502	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V	
C503	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V	
C504	1-164-346-11	CERAMIC CHIP	1uF		16V	
C510	1-164-346-11	CERAMIC CHIP	1uF		16V	
C511	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V	
C512	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V	
C513	1-164-346-11	CERAMIC CHIP	1uF		16V	
C530	1-164-346-11	CERAMIC CHIP	1uF		16V	
C531	1-164-346-11	CERAMIC CHIP	1uF		16V	
C532	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C533	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C541	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C542	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C543	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C544	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C545	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C546	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C547	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C548	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C549	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C570	1-128-007-11	ELECT CHIP	2.2uF	20%	35V	
C571	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C580	1-164-346-11	CERAMIC CHIP	1uF		16V	
C581	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C582	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C583	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C591	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C592	1-163-058-00	CERAMIC CHIP	0.0082uF	10%	50V	
C593	1-135-259-11	TANTALUM CHIP	10uF	20%	6.3V	
		(DIODE)				
D054	8-719-989-03	DIODE DAN222				
D055	8-719-989-03	DIODE DAN222				
D401	8-719-989-03	DIODE DAN222				
D402	8-719-989-00	DIODE DA221				
D403	8-719-420-81	DIODE MA3075WA				
D404	8-719-420-81	DIODE MA3075WA				
D405	8-719-420-81	DIODE MA3075WA				
		(FILTER)				
FL401	1-236-838-21	FILTER, BAND PASS				

Ref. No.	Part No.	Description	Remark
FL402	1-236-837-21	FILTER, BAND PASS	
		(IC)	
IC041	8-759-510-56	IC BA3570FS	
IC042	8-759-701-02	IC NJM2073M	
IC043	8-759-234-77	IC TC4S66F	
IC401	8-759-077-12	IC CXA1542R	
IC402	8-752-334-42	IC CXD2106Q	
IC403	8-752-053-21	IC CXA1211M	
IC404	8-759-108-09	IC uPD4012BG	
IC406	8-759-108-09	IC uPD4012BG	
		(JACK)	
J401	1-569-556-11	JACK (VIDEO, AUDIO)	
		(COIL)	
L052	1-412-031-11	INDUCTOR CHIP 47uH	
L401	1-412-031-11	INDUCTOR CHIP 47uH	
L402	1-412-029-11	INDUCTOR CHIP 10uH	
		(LINK, IC)	
⚠PS401	1-576-124-21	LINK, IC CCP2E25 (1A)	
⚠PS402	1-576-124-21	LINK, IC CCP2E25 (1A)	
		(TRANSISTOR)	
Q051	8-729-928-81	TRANSISTOR DTC144EE	
Q052	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q053	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q054	8-729-928-87	TRANSISTOR DTC124EE	
Q055	8-729-927-62	TRANSISTOR UMX1	
Q056	8-729-928-81	TRANSISTOR DTC144EE	
Q057	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q401	8-729-927-62	TRANSISTOR UMX1	
Q402	8-729-927-XX	TRANSISTOR 2SC4617R	
Q404	8-729-927-XX	TRANSISTOR 2SC4617R	
Q405	8-729-927-XX	TRANSISTOR 2SC4617R	
Q406	8-729-930-13	TRANSISTOR UMH2	
Q408	8-729-927-XX	TRANSISTOR 2SC4617R	
Q409	8-729-927-XX	TRANSISTOR 2SC4617R	
Q410	8-729-927-62	TRANSISTOR UMX1	
Q411	8-729-927-XX	TRANSISTOR 2SC4617R	
Q412	8-729-928-81	TRANSISTOR DTC144EE	
Q413	8-729-927-62	TRANSISTOR UMX1	
Q414	8-729-927-XX	TRANSISTOR 2SC4617R	
Q415	8-729-928-19	TRANSISTOR 2SA1774R	
Q416	8-729-928-81	TRANSISTOR DTC144EE	
Q417	8-729-928-19	TRANSISTOR 2SA1774R	
Q418	8-729-927-XX	TRANSISTOR 2SC4617R	
Q419	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q422	8-729-928-19	TRANSISTOR 2SA1774R	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

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Ref. No.	Part No.	Description				Remark
Q423	8-729-927-XX	TRANSISTOR 2SC4617R				
Q424	8-729-927-XX	TRANSISTOR 2SC4617R				
Q425	8-729-903-10	TRANSISTOR FMW1				
Q426	8-729-927-XX	TRANSISTOR 2SC4617R				
Q427	8-729-928-19	TRANSISTOR 2SA1774R				
Q428	8-729-928-81	TRANSISTOR DTC144EE				
Q501	8-729-927-XX	TRANSISTOR 2SC4617R				
Q502	8-729-927-XX	TRANSISTOR 2SC4617R				
Q591	8-729-927-XX	TRANSISTOR 2SC4617R				
Q592	8-729-927-XX	TRANSISTOR 2SC4617R				
Q593	8-729-928-90	TRANSISTOR DTC114EE				
Q594	8-729-928-81	TRANSISTOR DTC144EE				
		(RESISTOR)				
R051	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R052	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R053	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R054	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R055	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R056	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R057	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R058	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R059	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R061	1-216-015-00	METAL CHIP	39	5%	1/10W	
R062	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R063	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R064	1-216-015-00	METAL CHIP	39	5%	1/10W	
R065	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R067	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R068	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R069	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R070	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R071	1-216-815-11	METAL CHIP	330	5%	1/16W	
R072	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R073	1-216-789-11	METAL CHIP	2.2	5%	1/16W	
R074	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R075	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R076	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R077	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R085	1-216-013-00	METAL CHIP	33	5%	1/10W	
R086	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R087	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R089	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R090	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R401	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R402	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R403	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R404	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R405	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R406	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R408	1-216-864-11	METAL CHIP	0	5%	1/16W	
R410	1-216-864-11	METAL CHIP	0	5%	1/16W	
R411	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R412	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R413	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R414	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R415	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R416	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R417	1-216-864-11	METAL CHIP	0	5%	1/16W	
R418	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R420	1-216-816-11	METAL CHIP	390	5%	1/16W	
R421	1-216-811-11	METAL CHIP	150	5%	1/16W	
R423	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R425	1-218-740-11	METAL CHIP	100K	0.50%	1/16W	
R427	1-218-740-11	METAL CHIP	100K	0.50%	1/16W	
R430	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R431	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R432	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R433	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R434	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R435	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R436	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R437	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R438	1-216-795-11	METAL CHIP	6.8K	0.50%	1/16W	
R439	1-216-295-00	METAL CHIP	0	5%	1/10W	
R440	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R441	1-216-864-11	METAL CHIP	0	5%	1/16W	
R442	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R443	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R444	1-216-864-11	METAL CHIP	0	5%	1/16W	
R445	1-218-740-11	METAL CHIP	100K	0.50%	1/16W	
R446	1-218-714-11	METAL CHIP	8.2K	0.50%	1/16W	
R449	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R450	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R451	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R452	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R453	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R454	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R455	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R456	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R457	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R458	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R459	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R460	1-216-818-11	METAL CHIP	560	5%	1/16W	
R461	1-216-818-11	METAL CHIP	560	5%	1/16W	
R462	1-216-818-11	METAL CHIP	560	5%	1/16W	
R463	1-216-818-11	METAL CHIP	560	5%	1/16W	
R471	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R472	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R473	1-216-838-11	METAL CHIP	27K	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R474	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R475	1-218-740-11	METAL CHIP 100K 0.50% 1/16W	
R476	1-216-295-00	METAL CHIP 0 5% 1/10W	
R477	1-216-013-00	METAL CHIP 33 5% 1/10W	
R478	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R479	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R501	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R502	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R505	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R506	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R507	1-216-810-11	METAL CHIP 120 5% 1/16W	
R508	1-216-818-11	METAL CHIP 560 5% 1/16W	
R509	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R515	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R516	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R517	1-216-810-11	METAL CHIP 120 5% 1/16W	
R518	1-216-818-11	METAL CHIP 560 5% 1/16W	
R519	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R520	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R521	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R530	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R531	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R532	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R533	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R534	1-216-861-11	METAL CHIP 2.2M 5% 1/16W	
R535	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R536	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R537	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R541	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R542	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R543	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R544	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R545	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R546	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R547	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R548	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R549	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R551	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R552	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R553	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R554	1-216-816-11	METAL CHIP 390 5% 1/16W	
R555	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R556	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R557	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R558	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R559	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R560	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R561	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R562	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R563	1-216-864-11	METAL CHIP 0 5% 1/16W	
R564	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R569	1-216-864-11	METAL CHIP 0 5% 1/16W	
R572	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R573	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R574	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R575	1-216-848-11	METAL CHIP 180K 5% 1/16W	
R577	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R578	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R579	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R580	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R581	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R582	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R583	1-216-304-11	METAL CHIP 3.3 5% 1/10W	
R584	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R585	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R586	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R587	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R588	1-216-864-11	METAL CHIP 0 5% 1/16W	
R589	1-216-864-11	METAL CHIP 0 5% 1/16W	
R590	1-216-816-11	METAL CHIP 390 5% 1/16W	
R591	1-216-816-11	METAL CHIP 390 5% 1/16W	
R591-2	1-216-296-00	METAL CHIP 0 5% 1/8W	
R592	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R593	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R594	1-216-864-11	METAL CHIP 0 5% 1/16W	
R596	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R597	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R598	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R599	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	

(NETWORK, RES)

Ref. No.	Part No.	Description	Remark
RB501	1-236-436-11	NETWORK, RES 100K	
RB502	1-236-436-11	NETWORK, RES 100K	
RB503	1-236-436-11	NETWORK, RES 100K	
RB504	1-236-436-11	NETWORK, RES 100K	
RB505	1-236-432-11	NETWORK, RES 47K	

(FLEXIBLE BOARD)

Ref. No.	Part No.	Description	Remark
W001	1-645-362-11	FP-561 FLEXIBLE BOARD	

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1-645-369-11 FP-621 FLEXIBLE BOARD

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(JACK)

Ref. No.	Part No.	Description	Remark
J903	1-580-009-21	SOCKET, CONNECTOR (SQUARE) 12P	

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FU-109 HP-84 JK-86 LA-22 LA-23 MA-137

Ref. No.	Part No.	Description	Remark
*	A-7071-699-A	FU-109 BOARD, COMPLETE	
		**********************	
		(CAPACITOR)	
C301	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C302	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
		(CONNECTOR)	
CN301	1-573-916-21	CONNECTOR, FFC/FPC (ZIF) 7P	
		(DIODE)	
D301	8-719-951-20	LED BR1102W	
D302	8-719-422-91	DIODE MA8091	
		(RESISTOR)	
R301	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R302	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R303	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R304	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R305	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R306	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
		(SWITCH)	
S301	1-572-467-11	SWITCH, PUSH (1 KEY) (REC)	
S302	1-572-921-11	SWITCH, KEY BOARD (STOP)	
S303	1-572-921-11	SWITCH, KEY BOARD (FF)	
S304	1-572-921-11	SWITCH, KEY BOARD (PLAY)	
S305	1-572-921-11	SWITCH, KEY BOARD (SLOW)	
S306	1-572-921-11	SWITCH, KEY BOARD (STILL)	
S307	1-572-921-11	SWITCH, KEY BOARD (REW)	
**			
*	A-7071-696-A	HP-84 BOARD, COMPLETE	
		********************	
		(CONNECTOR)	
CN601	1-573-331-21	CONNECTOR, BOARD TO BOARD 6P	
		(DIODE)	
D601	8-719-420-87	DIODE MA8130	
		(JACK)	
J601	1-695-514-21	JACK (SMALL TYPE) 1P (PHONES)	
		(LINK, IC)	
⚠PS601	1-576-124-21	LINK, IC CCP2E25 (1A)	
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Ref. No.	Part No.	Description	Remark
*	A-7071-698-A	JK-86 BOARD, COMPLETE	
		********************	
		(CONNECTOR)	
CN902	1-691-491-21	CONNECTOR, FFC/FPC 12P	
		(DIODE)	
D901	8-719-420-81	DIODE MA3075WA	
D902	8-719-420-81	DIODE MA3075WA	
D903	8-719-420-81	DIODE MA3075WA	
D904	8-719-420-81	DIODE MA3075WA	
D905	8-719-420-81	DIODE MA3075WA	
D906	8-719-420-81	DIODE MA3075WA	
D907	8-719-420-87	DIODE MA8130	
		(JACK)	
J901	1-537-449-11	TERMINAL BOARD (TUNER)	
**			
*	A-7071-713-A	LA-22 BOARD, COMPLETE	
		********************	
		(CONNECTOR)	
CN801	1-569-628-12	CONNECTOR, BOARD TO BOARD 3P	
**			
*	A-7071-714-A	LA-23 BOARD, COMPLETE	
		********************	
		(CONNECTOR)	
CN802	1-569-628-12	CONNECTOR, BOARD TO BOARD 3P	
**			
*	A-7053-386-A	MA-137 BOARD, COMPLETE	
		*********************	
	3-719-381-01	SCREW (M2X4)	
		(CAPACITOR)	
C001	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C002	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C003	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C004	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C005	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C006	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C007	1-162-969-11	CERAMIC CHIP 0.0068uF 10% 25V	
C008	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C011	1-163-183-00	CERAMIC CHIP 120PF 5% 50V	
C012	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description				Remark
C013	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C015	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C017	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C018	1-164-473-11	CERAMIC CHIP	820PF	10%	50V	
C019	1-164-473-11	CERAMIC CHIP	820PF	10%	50V	
C020	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C021	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C022	1-162-962-11	CERAMIC CHIP	470PF	10%	50V	
C023	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C024	1-164-634-11	CERAMIC CHIP	1uF		16V	
C025	1-164-634-11	CERAMIC CHIP	1uF		16V	
C026	1-164-836-11	CERAMIC CHIP	6.8uF		16V	
C027	1-164-836-11	CERAMIC CHIP	6.8uF		16V	
C028	1-164-836-11	CERAMIC CHIP	6.8uF		16V	
C029	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C030	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C031	1-162-638-11	CERAMIC CHIP	1uF		16V	
C032	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C033	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C034	1-162-638-11	CERAMIC CHIP	1uF		16V	
C035	1-164-634-11	CERAMIC CHIP	1uF		16V	
C036	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C037	1-162-638-11	CERAMIC CHIP	1uF		16V	
C038	1-135-212-21	TANTAL. CHIP	2.2uF	20%	35V	
C039	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C040	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C041	1-164-836-11	CERAMIC CHIP	6.8uF		16V	
C042	1-164-836-11	CERAMIC CHIP	6.8uF		16V	
C043	1-164-836-11	CERAMIC CHIP	6.8uF		16V	
C044	1-164-836-11	CERAMIC CHIP	6.8uF		16V	
C091	1-164-346-11	CERAMIC CHIP	1uF		16V	
C092	1-164-346-11	CERAMIC CHIP	1uF		16V	
C093	1-164-346-11	CERAMIC CHIP	1uF		16V	
C094	1-164-346-11	CERAMIC CHIP	1uF		16V	
C095	1-164-346-11	CERAMIC CHIP	1uF		16V	
C096	1-164-346-11	CERAMIC CHIP	1uF		16V	
C097	1-164-346-11	CERAMIC CHIP	1uF		16V	
C098	1-164-506-11	CERAMIC CHIP	4.7uF		16V	
C099	1-164-506-11	CERAMIC CHIP	4.7uF		16V	
C101	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C102	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C103	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C104	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C106	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C108	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C109	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C110	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C111	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C112	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C113	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	

Ref. No.	Part No.	Description				Remark
C114	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C115	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C116	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C117	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C118	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C119	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C120	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C121	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C122	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C123	1-164-362-11	CERAMIC CHIP	470PF	5%	50V	
C124	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	
C125	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C126	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C127	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C128	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C129	1-162-905-11	CERAMIC CHIP	1PF	0.25PF	50V	
C130	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C131	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C132	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C133	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C135	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C136	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C137	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C138	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C139	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C140	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C141	1-164-634-11	CERAMIC CHIP	1uF		16V	
C142	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C143	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C144	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C145	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C146	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C147	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C148	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C149	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C150	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C151	1-135-216-11	TANTALUM CHIP	10uF	20%	10V	
C152	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C153	1-135-216-11	TANTALUM CHIP	10uF	20%	10V	
C154	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C155	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C157	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C158	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C159	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C160	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C161	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C201	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C202	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C203	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C204	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	

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Ref. No.	Part No.	Description	Remark
C205	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C206	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C211	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C212	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C215	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C216	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C217	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C218	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C220	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C222	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C224	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C225	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C226	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C227	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C228	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C229	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C230	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C231	1-164-634-11	CERAMIC CHIP 1uF 16V	
C232	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C233	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C234	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C235	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C236	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C237	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C238	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C239	1-164-634-11	CERAMIC CHIP 1uF 16V	
C240	1-164-634-11	CERAMIC CHIP 1uF 16V	
C245	1-135-092-21	TANTALUM CHIP 3.3uF 10% 16V	
C246	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C247	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C248	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C250	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C251	1-162-943-11	CERAMIC CHIP 15PF 5% 50V	
C252	1-162-943-11	CERAMIC CHIP 15PF 5% 50V	
C254	1-164-346-11	CERAMIC CHIP 1uF 16V	
C255	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C256	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C257	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C258	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C301	1-164-634-11	CERAMIC CHIP 1uF 16V	
C302	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C303	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C304	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C305	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C306	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C307	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C308	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C309	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C310	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C311	1-162-995-11	CERAMIC CHIP 0.022uF 50V	

Ref. No.	Part No.	Description	Remark
C312	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C313	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C314	1-164-173-11	CERAMIC CHIP 0.0039uF 10% 50V	
C315	1-164-634-11	CERAMIC CHIP 1uF 16V	
C316	1-135-211-11	TANTAL. CHIP 6.8uF 20% 6.3V	
C317	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C318	1-164-634-11	CERAMIC CHIP 1uF 16V	
C320	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C321	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C322	1-165-128-11	CERAMIC CHIP 0.22uF 16V	
C324	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C325	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C326	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C327	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C328	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C329	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C330	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C331	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C341	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C342	1-135-216-11	TANTALUM CHIP 10uF 20% 10V	
C343	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C344	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C345	1-164-330-21	CERAMIC CHIP 0.22uF 10% 16V	
C346	1-164-330-21	CERAMIC CHIP 0.22uF 10% 16V	
C347	1-135-216-11	TANTALUM CHIP 10uF 20% 10V	
C349	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C350	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C351	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C352	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C353	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C354	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C356	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C358	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C359	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C360	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C601	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C607	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C608	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C614	1-164-461-11	CERAMIC CHIP 91PF 5% 50V	
C615	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C616	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C617	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C618	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C619	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C620	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C621	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C622	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C624	1-164-457-11	CERAMIC CHIP 30PF 5% 50V	
C625	1-162-951-11	CERAMIC CHIP 68PF 5% 50V	
C626	1-162-954-11	CERAMIC CHIP 120PF 5% 50V	

Ref. No.	Part No.	Description				Remark
C627	1-162-955-11	CERAMIC CHIP	150PF	5%	50V	
C629	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C630	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C631	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C652	1-162-921-11	CERAMIC CHIP	33PF	5%	50V	
C653	1-162-958-11	CERAMIC CHIP	270PF	5%	50V	
C666	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C667	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C668	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C669	1-162-938-11	CERAMIC CHIP	7PF	0.5PF	50V	
C670	1-162-919-11	CERAMIC CHIP	22PF	5%	50V	
C671	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C672	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C673	1-162-958-11	CERAMIC CHIP	270PF	5%	50V	
C676	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C677	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C678	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C679	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C680	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C681	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C683	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C684	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C685	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C687	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C688	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C689	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C691	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C694	1-162-948-11	CERAMIC CHIP	39PF	5%	50V	
C695	1-162-944-11	CERAMIC CHIP	18PF	5%	50V	
C696	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C697	1-162-943-11	CERAMIC CHIP	15PF	5%	50V	
C698	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C699	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C702	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C703	1-135-201-11	TANTALUM CHIP	10uF	20%	4V	
C706	1-135-201-11	TANTALUM CHIP	10uF	20%	4V	
C707	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C708	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C709	1-164-145-11	CERAMIC CHIP	390PF	5%	50V	
C710	1-164-467-11	CERAMIC CHIP	300PF	5%	50V	
C711	1-135-201-11	TANTALUM CHIP	10uF	20%	4V	
C712	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C713	1-162-954-11	CERAMIC CHIP	120PF	5%	50V	
C714	1-162-952-11	CERAMIC CHIP	82PF	5%	50V	
C715	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C716	1-135-201-11	TANTALUM CHIP	10uF	20%	4V	
C717	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C718	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C719	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C720	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C721	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V	
C722	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C723	1-135-201-11	TANTALUM CHIP	10uF	20%	4V	
C724	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V	
C725	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C727	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C728	1-164-634-11	CERAMIC CHIP	1uF		16V	
C729	1-164-634-11	CERAMIC CHIP	1uF		16V	
C730	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C731	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C732	1-165-128-11	CERAMIC CHIP	0.22uF		16V	
C733	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V	
C734	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C735	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C736	1-135-335-91	TANTAL. CHIP	100uF	20%	4V	
C737	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C738	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C741	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C742	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C743	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C744	1-162-948-11	CERAMIC CHIP	39PF	5%	50V	
C747	1-162-955-11	CERAMIC CHIP	150PF	5%	50V	
C750	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C751	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C752	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C753	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C754	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C756	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C757	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C758	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C760	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V	
C761	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C762	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V	
C763	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C764	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C765	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V	
C766	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C768	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C769	1-164-634-11	CERAMIC CHIP	1uF		16V	
C770	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C771	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C775	1-162-948-11	CERAMIC CHIP	39PF	5%	50V	
C776	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C777	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C778	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C779	1-162-948-11	CERAMIC CHIP	39PF	5%	50V	
C781	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C783	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C784	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C786	1-164-634-11	CERAMIC CHIP	1uF		16V	

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Ref. No.	Part No.	Description	Remark
C787	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C788	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C789	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C791	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C795	1-164-465-91	CERAMIC CHIP 200PF 5% 50V	
C797	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C798	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C803	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C804	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C805	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C806	1-162-952-11	CERAMIC CHIP 82PF 5% 50V	
C807	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C809	1-162-959-11	CERAMIC CHIP 330PF 5% 50V	
C810	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	
C811	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	
C812	1-135-146-21	TANTALUM CHIP 0.68uF 20% 25V	
C813	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C816	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C817	1-162-950-11	CERAMIC CHIP 56PF 5% 50V	
C818	1-162-936-11	CERAMIC CHIP 5PF 0.25PF 50V	
C819	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C820	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C821	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C822	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C823	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C824	1-162-951-11	CERAMIC CHIP 68PF 5% 50V	
C826	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C827	1-162-950-11	CERAMIC CHIP 56PF 5% 50V	
C831	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C832	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C833	1-162-952-11	CERAMIC CHIP 82PF 5% 50V	
C834	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C835	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C836	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C837	1-162-955-11	CERAMIC CHIP 150PF 5% 50V	
C873	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C981	1-164-506-11	CERAMIC CHIP 4.7uF 16V	
C982	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C998	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C1801	1-164-634-11	CERAMIC CHIP 1uF 16V	
C1802	1-164-634-11	CERAMIC CHIP 1uF 16V	
		(FILTER, CERAMIC)	
CF801	1-579-370-11	FILTER, CERAMIC	
		(CONNECTOR)	
* CN002	1-580-055-21	PIN, CONNECTOR 2P	
CN003	1-573-303-21	CONNECTOR, BOARD TO BOARD 6P	
CN004	1-695-883-21	CONNECTOR, BOARD TO BOARD 32P	
* CN005	1-560-890-00	PIN, CONNECTOR 2P	
CN007	1-573-343-21	CONNECTOR, BOARD TO BOARD 30P	
CN011	1-573-922-21	CONNECTOR, FFC/FPC (ZIF) 13P	
CN012	1-573-353-21	CONNECTOR, FFC/FPC 13P	
CN013	1-691-495-21	CONNECTOR, FFC/FPC 16P	
CN015	1-573-921-11	CONNECTOR, FFC/FPC (ZIF) 12P	
CN016	1-573-923-21	CONNECTOR, FFC/FPC (ZIF) 14P	
CN017	1-691-491-21	CONNECTOR, FFC/FPC 12P	
		(DIODE)	
D001	8-719-989-33	DIODE FC806	
D002	8-719-989-03	DIODE DAN222	
D004	8-719-991-00	DIODE DAP222	
D101	8-719-989-03	DIODE DAN222	
D199	8-719-422-91	DIODE MA8091	
D301	8-719-989-00	DIODE DA221	
D310	8-719-989-03	DIODE DAN222	
D601	8-719-951-22	DIODE IMN10	
D602	8-719-989-03	DIODE DAN222	
D603	8-719-989-03	DIODE DAN222	
D701	8-719-989-03	DIODE DAN222	
D1000	8-719-422-91	DIODE MA8091	
D1001	8-719-422-91	DIODE MA8091	
D1002	8-719-989-03	DIODE DAN222	
		(FUSE)	
⚠F101	1-576-213-21	FUSE, CHIP (1.6A, 125V)	
⚠F102	1-576-213-21	FUSE, CHIP (1.6A, 125V)	
⚠F103	1-576-213-21	FUSE, CHIP (1.6A, 125V)	
⚠F104	1-576-213-21	FUSE, CHIP (1.6A, 125V)	
⚠F105	1-576-213-21	FUSE, CHIP (1.6A, 125V)	
		(FERRITE BEAD)	
FB101	1-412-390-21	INDUCTOR CHIP 0uH	
FB102	1-412-390-21	INDUCTOR CHIP 0uH	
FB103	1-412-390-21	INDUCTOR CHIP 0uH	
FB105	1-412-390-21	INDUCTOR CHIP 0uH	
FB201	1-412-390-21	INDUCTOR CHIP 0uH	
FB204	1-412-390-21	INDUCTOR CHIP 0uH	
FB205	1-412-390-21	INDUCTOR CHIP 0uH	
FB206	1-412-390-21	INDUCTOR CHIP 0uH	
FB301	1-412-390-21	INDUCTOR CHIP 0uH	
		(FILTER)	
FL701	1-236-757-21	FILTER, LOW PASS (C)	
FL801	1-239-348-21	FILTER, BAND PASS (CE.NTSC)	
FL802	1-239-109-21	FILTER, BAND PASS	
		(IC)	
IC001	8-759-060-94	IC MB3785APFV-G-BND-ER	
IC091	8-759-509-13	IC XRU4052BF	

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Ref. No.	Part No.	Description	Remark
IC101	8-752-836-15	IC CXP80624A-010R	
IC102	8-759-039-01	IC MPC1720M	
IC103	8-759-990-55	IC CXA8006M	
IC201	8-759-099-93	IC MB89092-109	
IC202	8-759-512-69	IC S-81350HG-KD	
IC203	8-759-946-03	IC S-8054ALR-LN-S	
IC204	8-759-044-78	IC AK6420F	
IC205	8-759-999-02	IC TL1596CDB	
IC206	8-759-635-27	IC M62352GP	
IC301	8-759-512-42	IC CXA1481R	
IC601	8-759-012-00	IC MC10H116M	
IC602	8-752-053-21	IC CXA1211M	
IC603	8-759-998-32	IC CXD-2107M	
IC701	8-752-065-54	IC CXA1207AR	
IC702	8-752-053-21	IC CXA1211M	
IC703	8-759-636-33	IC CXA1452	
IC704	8-752-332-68	IC CXL5502M	
IC705	8-759-635-27	IC M62352GP	
IC707	8-759-710-86	IC NJM2233BM	
IC801	8-752-065-56	IC CXA1208R	

⟨ JACK ⟩

Ref. No.	Part No.	Description	Remark
J101	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	

⟨ COIL ⟩

Ref. No.	Part No.	Description	Remark
L001	1-424-653-11	COIL, CHOKE 10uH	
L002	1-424-674-21	COIL, CHOKE 22uH	
L003	1-412-028-11	INDUCTOR CHIP 4.7uH	
L004	1-412-028-11	INDUCTOR CHIP 4.7uH	
L005	1-424-653-11	COIL, CHOKE 10uH	
L006	1-412-032-11	INDUCTOR CHIP 100uH	
L007	1-412-032-11	INDUCTOR CHIP 100uH	
L008	1-412-032-11	INDUCTOR CHIP 100uH	
L009	1-424-653-11	COIL, CHOKE 10uH	
L010	1-424-674-21	COIL, CHOKE 22uH	
L011	1-424-674-21	COIL, CHOKE 22uH	
L101	1-412-031-11	INDUCTOR CHIP 47uH	
L201	1-412-031-11	INDUCTOR CHIP 47uH	
L301	1-412-029-11	INDUCTOR CHIP 10uH	
L302	1-412-032-11	INDUCTOR CHIP 100uH	
L303	1-412-280-31	INDUCTOR 330uH	
L310	1-412-031-11	INDUCTOR CHIP 47uH	
L603	1-412-280-31	INDUCTOR 330uH	
L607	1-410-657-21	INDUCTOR CHIP 180uH	
L620	1-412-282-41	INDUCTOR 470uH	
L621	1-410-656-11	INDUCTOR CHIP 150uH	
L622	1-412-032-11	INDUCTOR CHIP 100uH	
L623	1-410-385-11	INDUCTOR CHIP 22uH	
L624	1-410-388-21	INDUCTOR CHIP 39uH	
L626	1-412-029-11	INDUCTOR CHIP 10uH	
L629	1-410-380-31	INDUCTOR CHIP 8.2uH	
L630	1-412-280-31	INDUCTOR 330uH	
L631	1-410-656-11	INDUCTOR CHIP 150uH	
L632	1-410-658-31	INDUCTOR CHIP 220uH	
L633	1-412-029-11	INDUCTOR CHIP 10uH	
L634	1-412-029-11	INDUCTOR CHIP 10uH	
L701	1-412-032-11	INDUCTOR CHIP 100uH	
L702	1-412-029-11	INDUCTOR CHIP 10uH	
L706	1-412-031-11	INDUCTOR CHIP 47uH	
L713	1-410-389-31	INDUCTOR CHIP 47uH	
L714	1-410-381-11	INDUCTOR CHIP 10uH	
L716	1-410-389-31	INDUCTOR CHIP 47uH	
L717	1-410-390-11	INDUCTOR CHIP 56uH	
L718	1-410-390-11	INDUCTOR CHIP 56uH	
L719	1-410-385-11	INDUCTOR CHIP 22uH	
L721	1-412-031-11	INDUCTOR CHIP 47uH	
L801	1-410-385-11	INDUCTOR CHIP 22uH	
L802	1-410-385-11	INDUCTOR CHIP 22uH	
L803	1-410-393-11	INDUCTOR CHIP 100uH	
L804	1-410-377-31	INDUCTOR CHIP 4.7uH	
L805	1-410-655-31	INDUCTOR CHIP 120uH	
L806	1-410-393-11	INDUCTOR CHIP 100uH	
L808	1-410-393-11	INDUCTOR CHIP 100uH	
L809	1-410-656-11	INDUCTOR CHIP 150uH	
L906	1-412-028-11	INDUCTOR CHIP 4.7uH	
L907	1-412-028-11	INDUCTOR CHIP 4.7uH	
L1000	1-412-026-11	INDUCTOR CHIP 1uH	

⟨ LINK, IC ⟩

Ref. No.	Part No.	Description	Remark
⚠PS101	1-576-123-21	LINK, IC CCP2E20 (0.8A)	
⚠PS201	1-576-122-21	LINK, IC CCP2E10 (0.4A)	

⟨ TRANSISTOR ⟩

Ref. No.	Part No.	Description	Remark
⚠Q001	8-729-823-84	TRANSISTOR FP102	
⚠Q002	8-729-823-84	TRANSISTOR FP102	
⚠Q003	8-729-823-84	TRANSISTOR FP102	
⚠Q004	8-729-805-25	TRANSISTOR 2SB1121-S	
Q005	8-729-927-XX	TRANSISTOR 2SC4617R	
⚠Q006	8-752-822-52	TRANSISTOR 2SK1469	
Q007	8-729-928-81	TRANSISTOR DTC144EE	
⚠Q008	8-752-822-52	TRANSISTOR 2SK1469	
Q009	8-729-928-81	TRANSISTOR DTC144EE	
Q010	8-729-928-27	TRANSISTOR DTA144EE	
Q012	8-729-928-81	TRANSISTOR DTC144EE	
Q091	8-729-927-XX	TRANSISTOR 2SC4617R	
Q092	8-729-927-XX	TRANSISTOR 2SC4617R	
Q093	8-729-927-XX	TRANSISTOR 2SC4617R	
Q101	8-729-420-12	TRANSISTOR XN4213	
Q103	8-729-820-46	TRANSISTOR 2SB1202FAS	
Q202	8-729-927-XX	TRANSISTOR 2SC4617R	

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Ref. No.	Part No.	Description	Remark
Q203	8-729-928-81	TRANSISTOR DTC144EE	
Q310	8-729-927-XX	TRANSISTOR 2SC4617R	
Q311	8-729-927-65	TRANSISTOR UMT1	
Q312	8-729-928-90	TRANSISTOR DTC114EE	
Q313	8-729-823-95	TRANSISTOR FC149	
Q609	8-729-927-XX	TRANSISTOR 2SC4617R	
Q611	8-729-927-XX	TRANSISTOR 2SC4617R	
Q619	8-729-928-72	TRANSISTOR DTA114TE	
Q621	8-729-928-72	TRANSISTOR DTA114TE	
Q622	8-729-927-XX	TRANSISTOR 2SC4617R	
Q623	8-729-927-XX	TRANSISTOR 2SC4617R	
Q625	8-729-928-72	TRANSISTOR DTA114TE	
Q626	8-729-927-XX	TRANSISTOR 2SC4617R	
Q627	8-729-927-XX	TRANSISTOR 2SC4617R	
Q628	8-729-928-19	TRANSISTOR 2SA1774R	
Q629	8-729-928-19	TRANSISTOR 2SA1774R	
Q630	8-729-927-XX	TRANSISTOR 2SC4617R	
Q631	8-729-927-XX	TRANSISTOR 2SC4617R	
Q632	8-729-927-XX	TRANSISTOR 2SC4617R	
Q633	8-729-927-XX	TRANSISTOR 2SC4617R	
Q634	8-729-928-81	TRANSISTOR DTC144EE	
Q701	8-729-928-81	TRANSISTOR DTC144EE	
Q702	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q703	8-729-202-38	TRANSISTOR 2SC3326N-A	
Q705	8-729-928-81	TRANSISTOR DTC144EE	
Q706	8-729-928-27	TRANSISTOR DTA144EE	
Q707	8-729-928-81	TRANSISTOR DTC144EE	
Q708	8-729-928-81	TRANSISTOR DTC144EE	
Q712	8-729-928-19	TRANSISTOR 2SA1774R	
Q713	8-729-927-XX	TRANSISTOR 2SC4617R	
Q714	8-729-927-XX	TRANSISTOR 2SC4617R	
Q717	8-729-927-XX	TRANSISTOR 2SC4617R	
Q719	8-729-927-XX	TRANSISTOR 2SC4617R	
Q720	8-729-927-XX	TRANSISTOR 2SC4617R	
Q721	8-729-927-XX	TRANSISTOR 2SC4617R	
Q722	8-729-927-XX	TRANSISTOR 2SC4617R	
Q723	8-729-928-27	TRANSISTOR DTA144EE	
Q724	8-729-928-19	TRANSISTOR 2SA1774R	
Q730	8-729-928-81	TRANSISTOR DTC144EE	
Q732	8-729-927-XX	TRANSISTOR 2SC4617R	
Q755	8-729-928-90	TRANSISTOR DTC114EE	
Q760	8-729-927-XX	TRANSISTOR 2SC4617R	
Q761	8-729-927-XX	TRANSISTOR 2SC4617R	
Q765	8-729-927-XX	TRANSISTOR 2SC4617R	
Q766	8-729-928-19	TRANSISTOR 2SA1774R	
Q768	8-729-905-35	TRANSISTOR 2SC4081-R	
Q801	8-729-927-XX	TRANSISTOR 2SC4617R	
Q803	8-729-928-81	TRANSISTOR DTC144EE	
Q804	8-729-927-XX	TRANSISTOR 2SC4617R	
Q805	8-729-928-19	TRANSISTOR 2SA1774R	

Ref. No.	Part No.	Description	Remark
Q806	8-729-927-XX	TRANSISTOR 2SC4617R	
Q807	8-729-930-13	TRANSISTOR UMH2	
Q1601	8-729-928-19	TRANSISTOR 2SA1774R	
Q1602	8-729-928-81	TRANSISTOR DTC144EE	
Q1603	8-729-928-19	TRANSISTOR 2SA1774R	
Q1604	8-729-930-13	TRANSISTOR UMH2	
Q1605	8-729-928-81	TRANSISTOR DTC144EE	
Q1606	8-729-928-72	TRANSISTOR DTA114TE	
Q1801	8-729-927-XX	TRANSISTOR 2SC4617R	
Q1802	8-729-927-XX	TRANSISTOR 2SC4617R	
Q1803	8-729-928-27	TRANSISTOR DTA144EE	

〈 RESISTOR 〉

Ref. No.	Part No.	Description				Remark
R001	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R003	1-216-864-11	METAL CHIP	0	5%	1/16W	
R004	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R005	1-218-345-11	METAL CHIP	9.1K	0.50%	1/16W	
R006	1-218-714-11	METAL CHIP	8.2K	0.50%	1/16W	
R007	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R008	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R009	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R011	1-216-864-11	METAL CHIP	0	5%	1/16W	
R012	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R013	1-218-738-11	METAL CHIP	82K	0.50%	1/16W	
R014	1-216-795-11	METAL CHIP	6.8K	0.50%	1/16W	
R015	1-216-795-11	METAL CHIP	6.8K	0.50%	1/16W	
R016	1-216-795-11	METAL CHIP	6.8K	0.50%	1/16W	
R017	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R018	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R019	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R020	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R021	1-218-295-11	METAL CHIP	5.6K	0.50%	1/16W	
R023	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R024	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R025	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R027	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R028	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R029	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R030	1-216-033-00	METAL CHIP	220	5%	1/10W	
R031	1-216-033-00	METAL CHIP	220	5%	1/10W	
R032	1-216-037-00	METAL CHIP	330	5%	1/10W	
R033	1-216-021-00	METAL CHIP	68	5%	1/10W	
R034	1-216-009-00	METAL CHIP	22	5%	1/10W	
R035	1-216-789-11	METAL CHIP	2.2	5%	1/16W	
R036	1-216-295-00	METAL CHIP	0	5%	1/10W	
R037	1-216-295-00	METAL CHIP	0	5%	1/10W	
R038	1-216-864-11	METAL CHIP	0	5%	1/16W	
R040	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R041	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R048	1-216-821-11	METAL CHIP	1K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R049	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R081	1-216-025-00	METAL CHIP	100	5%	1/10W	
R082	1-216-025-00	METAL CHIP	100	5%	1/10W	
R093	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R094	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R095	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R096	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R097	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R098	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R102	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R103	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R104	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R106	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R107	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R108	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R109	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R110	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R111	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R112	1-216-295-00	METAL CHIP	0	5%	1/10W	
R113	1-216-295-00	METAL CHIP	0	5%	1/10W	
R114	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R115	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R116	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R117	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R121	1-216-864-11	METAL CHIP	0	5%	1/16W	
R122	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R123	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R124	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R125	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R126	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R127	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R128	1-216-295-00	METAL CHIP	0	5%	1/10W	
R129	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R130	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R131	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R132	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R133	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R134	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R135	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R137	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R153	1-216-864-11	METAL CHIP	0	5%	1/16W	
R193	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R194	1-216-864-11	METAL CHIP	0	5%	1/16W	
R195	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R196	1-218-348-11	METAL CHIP	110K	5%	1/16W	
R197	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R198	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R199	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R199	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R201	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R202	1-216-295-00	METAL CHIP	0	5%	1/10W	
R203	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R204	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R205	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R206	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R208	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R209	1-216-815-11	METAL CHIP	330	5%	1/16W	
R210	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R211	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R212	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R213	1-216-815-11	METAL CHIP	330	5%	1/16W	
R214	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R215	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R217	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R220	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R221	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R222	1-216-295-00	METAL CHIP	0	5%	1/10W	
R223	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R224	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R225	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R226	1-216-295-00	METAL CHIP	0	5%	1/10W	
R227	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R228	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R230	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R231	1-216-295-00	METAL CHIP	0	5%	1/10W	
R233	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R234	1-216-295-00	METAL CHIP	0	5%	1/10W	
R235	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R236	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R237	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R238	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R239	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R240	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R241	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R242	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R244	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R272	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R273	1-216-809-11	METAL CHIP	100	5%	1/16W	
R274	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R275	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R283	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R284	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R285	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R286	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R299	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R301	1-216-817-11	METAL CHIP	470	5%	1/16W	
R302	1-216-817-11	METAL CHIP	470	5%	1/16W	
R303	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R303-2	1-216-295-00	METAL CHIP	0	5%	1/10W	

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Ref. No.	Part No.	Description				Remark
R304	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R305	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R306	1-216-295-00	METAL CHIP	0	5%	1/10W	
R307	1-216-295-00	METAL CHIP	0	5%	1/10W	
R308	1-216-295-00	METAL CHIP	0	5%	1/10W	
R309	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R310	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R311	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R312	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R313	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R314	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R315	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R316	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R317	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R319	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R322	1-216-819-11	METAL CHIP	680	5%	1/16W	
R330	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R331	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R333	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R334	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R336	1-216-037-00	METAL CHIP	330	5%	1/10W	
R337	1-217-671-11	METAL CHIP	1	5%	1/10W	
R338	1-217-671-11	METAL CHIP	1	5%	1/10W	
R339	1-217-671-11	METAL CHIP	1	5%	1/10W	
R340	1-217-671-11	METAL CHIP	1	5%	1/10W	
R341	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R342	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R343	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R344	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R345	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R346	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R347	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R348	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R349	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R354	1-216-864-11	METAL CHIP	0	5%	1/16W	
R356	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R357	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R360	1-216-174-00	METAL CHIP	100	5%	1/8W	
R362	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R363	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R364	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R365	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R367	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R368	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R369	1-216-295-00	METAL CHIP	0	5%	1/10W	
R373	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R374	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R381	1-216-864-11	METAL CHIP	0	5%	1/16W	
R397	1-216-864-11	METAL CHIP	0	5%	1/16W	
R602	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R603	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R606	1-216-817-11	METAL CHIP	470	5%	1/16W	
R607	1-216-817-11	METAL CHIP	470	5%	1/16W	
R612	1-216-817-11	METAL CHIP	470	5%	1/16W	
R613	1-216-817-11	METAL CHIP	470	5%	1/16W	
R614	1-216-809-11	METAL CHIP	100	5%	1/16W	
R615	1-216-818-11	METAL CHIP	560	5%	1/16W	
R616	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R617	1-216-817-11	METAL CHIP	470	5%	1/16W	
R618	1-216-817-11	METAL CHIP	470	5%	1/16W	
R619	1-216-817-11	METAL CHIP	470	5%	1/16W	
R620	1-216-817-11	METAL CHIP	470	5%	1/16W	
R621	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R622	1-216-817-11	METAL CHIP	470	5%	1/16W	
R623	1-216-818-11	METAL CHIP	560	5%	1/16W	
R624	1-216-812-11	METAL CHIP	180	5%	1/16W	
R626	1-216-817-11	METAL CHIP	470	5%	1/16W	
R627	1-216-817-11	METAL CHIP	470	5%	1/16W	
R628	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R629	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R634	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R635	1-216-818-11	METAL CHIP	560	5%	1/16W	
R636	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R637	1-216-815-11	METAL CHIP	330	5%	1/16W	
R639	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R640	1-216-864-11	METAL CHIP	0	5%	1/16W	
R642	1-216-818-11	METAL CHIP	560	5%	1/16W	
R643	1-216-819-11	METAL CHIP	680	5%	1/16W	
R644	1-216-811-11	METAL CHIP	150	5%	1/16W	
R646	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R662	1-216-820-11	METAL CHIP	820	5%	1/16W	
R663	1-216-864-11	METAL CHIP	0	5%	1/16W	
R664	1-216-814-11	METAL CHIP	270	5%	1/16W	
R667	1-216-818-11	METAL CHIP	560	5%	1/16W	
R668	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R669	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R671	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R672	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R673	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R674	1-216-813-11	METAL CHIP	220	5%	1/16W	
R675	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R676	1-216-814-11	METAL CHIP	270	5%	1/16W	
R677	1-216-809-11	METAL CHIP	100	5%	1/16W	
R678	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R679	1-216-864-11	METAL CHIP	0	5%	1/16W	
R680	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R682	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R683	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R685	1-216-819-11	METAL CHIP	680	5%	1/16W	
R686	1-216-816-11	METAL CHIP	390	5%	1/16W	

Ref.No.	Part No.	Description				Remark
R687	1-216-819-11	METAL CHIP	680	5%	1/16W	
R688	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R689	1-216-819-11	METAL CHIP	680	5%	1/16W	
R690	1-216-818-11	METAL CHIP	560	5%	1/16W	
R691	1-216-817-11	METAL CHIP	470	5%	1/16W	
R692	1-216-816-11	METAL CHIP	390	5%	1/16W	
R693	1-216-819-11	METAL CHIP	680	5%	1/16W	
R694	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R703	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R704	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R705	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R706	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R708	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R709	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R710	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R711	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R712	1-216-817-11	METAL CHIP	470	5%	1/16W	
R714	1-216-816-11	METAL CHIP	390	5%	1/16W	
R715	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R716	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R717	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R720	1-216-812-11	METAL CHIP	180	5%	1/16W	
R721	1-216-015-00	METAL CHIP	39	5%	1/10W	
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R723	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R724	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R725	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R726	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R727	1-216-864-11	METAL CHIP	0	5%	1/16W	
R729	1-216-013-00	METAL CHIP	33	5%	1/10W	
R730	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R731	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R732	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R733	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R734	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R735	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R737	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R738	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R740	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R741	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R742	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R743	1-216-864-11	METAL CHIP	0	5%	1/16W	
R744	1-216-815-11	METAL CHIP	330	5%	1/16W	
R745	1-216-820-11	METAL CHIP	820	5%	1/16W	
R746	1-216-817-11	METAL CHIP	470	5%	1/16W	
R747	1-216-864-11	METAL CHIP	0	5%	1/16W	
R752	1-216-864-11	METAL CHIP	0	5%	1/16W	
R753	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R754	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R755	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R756	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R757	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R758	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R759	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R761	1-216-864-11	METAL CHIP	0	5%	1/16W	
R762	1-216-864-11	METAL CHIP	0	5%	1/16W	
R764	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R765	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R766	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R767	1-216-817-11	METAL CHIP	470	5%	1/16W	
R768	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R769	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R770	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R771	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R772	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R773	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R774	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R784	1-216-864-11	METAL CHIP	0	5%	1/16W	
R785	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R786	1-216-817-11	METAL CHIP	470	5%	1/16W	
R787	1-216-820-11	METAL CHIP	820	5%	1/16W	
R788	1-216-820-11	METAL CHIP	820	5%	1/16W	
R789	1-216-815-11	METAL CHIP	330	5%	1/16W	
R790	1-216-819-11	METAL CHIP	680	5%	1/16W	
R791	1-216-817-11	METAL CHIP	470	5%	1/16W	
R792	1-216-820-11	METAL CHIP	820	5%	1/16W	
R793	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R795	1-216-864-11	METAL CHIP	0	5%	1/16W	
R796	1-216-814-11	METAL CHIP	270	5%	1/16W	
R797	1-216-864-11	METAL CHIP	0	5%	1/16W	
R798	1-216-809-11	METAL CHIP	100	5%	1/16W	
R799	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R801	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R802	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R803	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R804	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R806	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R807	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R808	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R809	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R810	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R811	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R815	1-216-864-11	METAL CHIP	0	5%	1/16W	
R816	1-216-817-11	METAL CHIP	470	5%	1/16W	
R817	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R818	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R819	1-216-809-11	METAL CHIP	100	5%	1/16W	
R821	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R822	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	

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Ref. No.	Part No.	Description				Remark
R823	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R824	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R825	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R826	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R828	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R829	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R830	1-216-818-11	METAL CHIP	560	5%	1/16W	
R831	1-216-864-11	METAL CHIP	0	5%	1/16W	
R832	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R834	1-216-864-11	METAL CHIP	0	5%	1/16W	
R835	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R842	1-216-864-11	METAL CHIP	0	5%	1/16W	
R868	1-216-864-11	METAL CHIP	0	5%	1/16W	
R873	1-216-864-11	METAL CHIP	0	5%	1/16W	
R876	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R887	1-216-864-11	METAL CHIP	0	5%	1/16W	
R889	1-216-864-11	METAL CHIP	0	5%	1/16W	
R893	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R894	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1000	1-216-295-00	METAL CHIP	0	5%	1/10W	
R1602	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1603	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1604	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1605	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1606	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1607	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R1701	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R1702	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R1703	1-216-820-11	METAL CHIP	820	5%	1/16W	
R1704	1-216-819-11	METAL CHIP	680	5%	1/16W	
R1705	1-216-819-11	METAL CHIP	680	5%	1/16W	
R1706	1-216-819-11	METAL CHIP	680	5%	1/16W	
R1707	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1708	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1718	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R1719	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R1720	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1721	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1722	1-216-797-11	METAL CHIP	10	5%	1/16W	
R1725	1-216-819-11	METAL CHIP	680	5%	1/16W	
R1726	1-216-022-00	METAL CHIP	75	5%	1/10W	
R1728	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1732	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1733	1-216-820-11	METAL CHIP	820	5%	1/16W	
R1734	1-218-484-11	METAL CHIP	750	5%	1/16W	
R1736	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1750	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1801	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1803	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1805	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R1806	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R1807	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1808	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1809	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1810	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R1811	1-216-833-11	METAL CHIP	10K	5%	1/16W	
		〈 NETWORK, RES 〉				
RB101	1-236-412-11	NETWORK, RES	1.0K			
RB102	1-236-412-11	NETWORK, RES	1.0K			
RB103	1-236-412-11	NETWORK, RES	1.0K			
RB104	1-236-424-11	NETWORK, RES	10K			
RB105	1-236-424-11	NETWORK, RES	10K			
RB106	1-236-424-11	NETWORK, RES	10K			
RB107	1-236-412-11	NETWORK, RES	1.0K			
RB108	1-236-424-11	NETWORK, RES	10K			
RB109	1-236-436-11	NETWORK, RES	100K			
RB110	1-236-436-11	NETWORK, RES	100K			
RB111	1-236-436-11	NETWORK, RES	100K			
RB112	1-236-412-11	NETWORK, RES	1.0K			
RB151	1-236-904-11	NETWORK, RES	1.0K			
RB152	1-236-904-11	NETWORK, RES	1.0K			
RB153	1-236-904-11	NETWORK, RES	1.0K			
RB154	1-236-904-11	NETWORK, RES	1.0K			
RB155	1-236-904-11	NETWORK, RES	1.0K			
RB156	1-236-904-11	NETWORK, RES	1.0K			
RB157	1-236-908-11	NETWORK, RES	10K			
RB158	1-236-908-11	NETWORK, RES	10K			
RB201	1-236-436-11	NETWORK, RES	100K			
RB203	1-236-412-11	NETWORK, RES	1.0K			
RB204	1-236-412-11	NETWORK, RES	1.0K			
RB205	1-236-412-11	NETWORK, RES	1.0K			
RB206	1-236-412-11	NETWORK, RES	1.0K			
RB208	1-236-424-11	NETWORK, RES	10K			
RB209	1-236-424-11	NETWORK, RES	10K			
RB210	1-236-424-11	NETWORK, RES	10K			
RB212	1-236-424-11	NETWORK, RES	10K			
RB221	1-236-424-11	NETWORK, RES	10K			
RB222	1-236-424-11	NETWORK, RES	10K			
RB224	1-236-424-11	NETWORK, RES	10K			
RB251	1-236-904-11	NETWORK, RES	1.0K			
RB352	1-236-424-11	NETWORK, RES	10K			
RB353	1-236-424-11	NETWORK, RES	10K			
RB600	1-236-424-11	NETWORK, RES	10K			
RB702	1-236-424-11	NETWORK, RES	10K			
RB703	1-236-424-11	NETWORK, RES	10K			
RB704	1-236-424-11	NETWORK, RES	10K			
RB801	1-236-412-11	NETWORK, RES	1.0K			
RB802	1-236-412-11	NETWORK, RES	1.0K			
RB803	1-236-412-11	NETWORK, RES	1.0K			

Ref. No.	Part No.	Description	Remark
RB804	1-236-412-11	NETWORK, RES 1.0K	
		(VARIABLE RESISTOR)	
RV701	1-241-475-11	RES, ADJ, CERMET 1K	
		(SWITCH)	
S201	1-572-921-11	SWITCH, KEY BOARD	
		(TRANSFORMER)	
T001	1-423-308-21	TRANSFORMER, CONVERTER	
		(CRYSTAL)	
X101	1-579-367-21	VIBRATOR, CRYSTAL (11.89MHz)	
X201	1-579-369-21	VIBRATOR (10MHz)	
X202	1-579-550-11	VIBRATOR, CRYSTAL (32.768kHz)	
X801	1-579-365-21	VIBRATOR, CRYSTAL (3.58MHz)	

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Ref. No.	Part No.	Description	Remark
*	A-7071-697-A	PE-13 BOARD, COMPLETE	
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		(CAPACITOR)	
C201	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C202	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C203	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C204	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
		(CONNECTOR)	
CN201	1-573-346-21	CONNECTOR, FFC/FPC 6P	
		(RESISTOR)	
R201	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
		(SWITCH)	
S201	1-572-921-11	SWITCH, KEY BOARD (EJECT)	
S202	1-572-921-11	SWITCH, KEY BOARD (POWER)	
S203	1-572-921-11	SWITCH, KEY BOARD (COUNTER RESET)	
S204	1-572-921-11	SWITCH, KEY BOARD (DATA SCREEN)	
S206	1-692-280-11	SWITCH, PUSH (1 KEY) (LCD ON SW)	

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Ref. No.	Part No.	Description	Remark
*	A-7053-327-A	RG-25 BOARD, COMPLETE	
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		(CAPACITOR)	
C901	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C902	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C903	1-126-206-11	ELECT CHIP 100uF 20% 6.3V	
C904	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C905	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C906	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
C907	1-162-925-11	CERAMIC CHIP 68PF 5% 50V	
C908	1-162-915-11	CERAMIC CHIP 10PF 0.5PF 50V	
C909	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C910	1-128-065-11	ELECT CHIP 68uF 20% 10V	
C911	1-164-382-11	CERAMIC CHIP 91PF 5% 50V	
C912	1-162-924-11	CERAMIC CHIP 56PF 5% 50V	
C913	1-164-382-11	CERAMIC CHIP 91PF 5% 50V	
C914	1-162-924-11	CERAMIC CHIP 56PF 5% 50V	
C915	1-164-382-11	CERAMIC CHIP 91PF 5% 50V	
C916	1-162-924-11	CERAMIC CHIP 56PF 5% 50V	
C917	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
C918	1-135-070-00	TANTALUM CHIP 0.1uF 10% 35V	
C919	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C920	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	
C921	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C924	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C926	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C927	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
C928	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C929	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C931	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C932	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C933	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C934	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C936	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C937	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C941	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C942	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C943	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C947	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C951	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C952	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C953	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C954	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C955	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C956	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C961	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C962	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C967	1-162-921-11	CERAMIC CHIP 33PF 5% 50V	
C969	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C970	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C975	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C976	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C977	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C978	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C979	1-135-215-21	TANTAL. CHIP 6.8uF 20% 16V	
C997	1-163-833-00	CERAMIC CHIP 0.068uF 25V	

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Ref. No.	Part No.	Description	Remark
		〈 CONNECTOR 〉	
CN901	1-573-315-21	CONNECTOR, BOARD TO BOARD 30P	
		〈 CAP, TRIMMER 〉	
CV901	1-141-311-11	CAP, TRIMMER 20PF	
		〈 DIODE 〉	
D901	8-719-989-03	DIODE DAN222	
D902	8-719-989-03	DIODE DAN222	
D903	8-719-938-67	LED GL-3EG8	
		〈 IC 〉	
IC901	8-752-056-40	IC CXA1385Q	
IC902	8-752-057-28	IC CXA1485Q	
IC903	8-759-084-06	IC uPD6453GT-622-E2	
IC904	8-759-234-13	IC TC4S30F	
IC905	8-759-209-69	IC TC4S11F	
IC906	8-759-635-27	IC M62352GP	
		〈 COIL 〉	
L901	1-412-031-11	INDUCTOR CHIP 47uH	
L902	1-412-030-11	INDUCTOR CHIP 22uH	
L903	1-412-955-11	INDUCTOR 22uH	
L904	1-412-955-11	INDUCTOR 22uH	
L905	1-412-955-11	INDUCTOR 22uH	
L960	1-412-198-11	INDUCTOR 220uH	
L961	1-412-191-11	INDUCTOR 47uH	
		〈 TRANSISTOR 〉	
Q903	8-729-928-81	TRANSISTOR DTC144EE	
Q904	8-729-928-81	TRANSISTOR DTC144EE	
Q906	8-729-928-19	TRANSISTOR 2SA1774R	
Q907	8-729-927-XX	TRANSISTOR 2SC4617R	
Q908	8-729-928-27	TRANSISTOR DTA144EE	
Q909	8-729-927-XX	TRANSISTOR 2SC4617R	
Q910	8-729-928-19	TRANSISTOR 2SA1774R	
Q911	8-729-928-81	TRANSISTOR DTC144EE	
		〈 RESISTOR 〉	
R901	1-216-864-11	METAL CHIP 0 5% 1/16W	
R902	1-216-815-11	METAL CHIP 330 5% 1/16W	
R903	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R904	1-218-724-11	METAL CHIP 22K 0.50% 1/16W	
R905	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R907	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R908	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R909	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R911	1-216-844-11	METAL CHIP 82K 5% 1/16W	
R912	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R913	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R914	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R915	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R916	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R918	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R919	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R920	1-218-725-11	METAL CHIP 24K 0.50% 1/16W	
R922	1-216-864-11	METAL CHIP 0 5% 1/16W	
R923	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R924	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R925	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R926	1-218-294-11	METAL CHIP 30K 5% 1/16W	
R927	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R928	1-218-725-11	METAL CHIP 24K 0.50% 1/16W	
R929	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R930	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R931	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R932	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R933	1-216-817-11	METAL CHIP 470 5% 1/16W	
R934	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R935	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R936	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R937	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R939	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R941	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R942	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R943	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R944	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R945	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R947	1-216-864-11	METAL CHIP 0 5% 1/16W	
R948	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R960	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R961	1-216-864-11	METAL CHIP 0 5% 1/16W	
R964	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R965	1-216-027-00	METAL CHIP 120 5% 1/10W	
R966	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R967	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R968	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R969	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R999	1-216-850-11	METAL CHIP 270K 5% 1/16W	
		〈 NETWORK, RES 〉	
RB960	1-236-412-11	NETWORK, RES 1.0K	
RB961	1-236-412-11	NETWORK, RES 1.0K	
RB962	1-236-412-11	NETWORK, RES 1.0K	
RB963	1-236-412-11	NETWORK, RES 1.0K	
		〈 VARIABLE RESISTOR 〉	
RV901	1-241-481-11	RES, ADJ, CERMET 100K	
RV902	1-241-481-11	RES, ADJ, CERMET 100K	
RV903	1-241-483-11	RES, ADJ, CERMET 470K	

(CRYSTAL)

Ref. No.	Part No.	Description	Remark
X901	1-579-041-11	VIBRATOR, CRYSTAL (3.58MHz)	

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Ref. No.	Part No.	Description	Remark
*	A-7063-328-A	RP-144 BOARD, COMPLETE	

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(CAPACITOR)

Ref. No.	Part No.	Description				Remark
C1001	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C1002	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C1003	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C1004	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C1005	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C1006	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C1007	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C1008	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C1009	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C1010	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C1011	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C1012	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C1013	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C1014	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C1015	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C1016	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C1017	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C1018	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C1019	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C1020	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C1021	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C1023	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C1024	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C1025	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C1041	1-164-360-11	CERAMIC CHIP	0.1uF		16V	
C1042	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C1043	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C1044	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C1045	1-162-952-11	CERAMIC CHIP	82PF	5%	50V	
C1046	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C1047	1-162-955-11	CERAMIC CHIP	150PF	5%	50V	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN052	1-691-490-21	CONNECTOR, FFC/FPC 11P	
CN053	1-573-768-21	PIN, CONNECTOR (1.5MM) (SMD)5P	

(IC)

Ref. No.	Part No.	Description	Remark
IC1001	8-752-033-38	IC CXA1202R	

(COIL)

Ref. No.	Part No.	Description		Remark
L1001	1-412-029-11	INDUCTOR CHIP	10uH	
L1002	1-412-033-11	INDUCTOR CHIP	220uH	
L1003	1-412-033-11	INDUCTOR CHIP	220uH	
L1041	1-412-198-11	INDUCTOR	220uH	
L1042	1-412-137-11	INDUCTOR	10uH	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q1001	8-729-928-27	TRANSISTOR DTA144EE	
Q1041	8-729-928-19	TRANSISTOR 2SA1774R	
Q1042	8-729-820-76	TRANSISTOR 2SA1179-M5M6	
Q1043	8-729-928-19	TRANSISTOR 2SA1774R	

(RESISTOR)

Ref. No.	Part No.	Description				Remark
R1001	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R1002	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1003	1-216-864-11	METAL CHIP	0	5%	1/16W	
R1004	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1006	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R1007	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1008	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R1009	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R1010	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R1011	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R1012	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R1013	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R1014	1-216-791-11	METAL CHIP	3.3	5%	1/16W	
R1015	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1016	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R1018	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R1019	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R1020	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R1021	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R1022	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R1023	1-216-809-11	METAL CHIP	100	5%	1/16W	
R1024	1-216-809-11	METAL CHIP	100	5%	1/16W	
R1041	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R1042	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R1043	1-216-814-11	METAL CHIP	270	5%	1/16W	
R1044	1-216-813-11	METAL CHIP	220	5%	1/16W	
R1045	1-216-803-11	METAL CHIP	33	5%	1/16W	
R1046	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R1047	1-216-799-11	METAL CHIP	15	5%	1/16W	
R1048	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R1049	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	

(FLEXIBLE BOARD)

Ref. No.	Part No.	Description	Remark
W051	1-645-994-11	FP-628 FLEXIBLE BOARD	

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SL-26 TM-118

Ref. No.	Part No.	Description	Remark
*	A-7063-329-A	SL-26 BOARD, COMPLETE *********************	
		(CAPACITOR)	
C101	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C102	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C103	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C104	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C105	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C106	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C107	1-165-128-11	CERAMIC CHIP 0.22uF 16V	
C108	1-165-128-11	CERAMIC CHIP 0.22uF 16V	
C109	1-165-128-11	CERAMIC CHIP 0.22uF 16V	
		(CONNECTOR)	
CN101	1-691-482-21	CONNECTOR, FFC/FPC 15P	
CN102	1-691-472-21	CONNECTOR, FFC/FPC 6P	
CN103	1-691-473-21	CONNECTOR, FFC/FPC 7P	
		(IC)	
IC101	8-759-059-09	IC LB8111V	
		(TRANSISTOR)	
Q101	8-729-902-93	TRANSISTOR FMG4	
		(RESISTOR)	
R101	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R102	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R103	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R104	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R106	1-216-150-00	METAL CHIP 10 5% 1/8W	
R107	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R108	1-216-864-11	METAL CHIP 0 5% 1/16W	
R111	1-216-864-11	METAL CHIP 0 5% 1/16W	
R112	1-216-864-11	METAL CHIP 0 5% 1/16W	
R113	1-216-864-11	METAL CHIP 0 5% 1/16W	
R114	1-216-864-11	METAL CHIP 0 5% 1/16W	
		(FLEXIBLE BOARD)	
W101	1-645-363-11	FP-562 FLEXIBLE BOARD	
W102	1-642-186-11	FP-437 FLEXIBLE BOARD	

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Ref. No.	Part No.	Description	Remark
*	A-7063-381-A	TM-118 BOARD, COMPLETE *********************	
		(BATTERY HOLDER)	
BT300	1-550-414-11	HOLDER, BATTERY	
		(CAPACITOR)	
C200	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C201	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C202	1-164-816-11	CERAMIC CHIP 220PF 2% 50V	
C203	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C204	1-164-346-11	CERAMIC CHIP 1uF 16V	
C205	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C206	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C207	1-162-960-11	CERAMIC CHIP 220PF 10% 50V	
C208	1-162-961-11	CERAMIC CHIP 330PF 10% 50V	
C209	1-135-159-21	TANTALUM CHIP 10uF 10% 20V	
C210	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C211	1-135-079-21	TANTALUM CHIP 3.3uF 10% 35V	
C212	1-135-161-21	TANTALUM CHIP 22uF 10% 10V	
C213	1-162-955-11	CERAMIC CHIP 150PF 5% 50V	
C214	1-163-036-00	CERAMIC CHIP 0.068uF 50V	
C215	1-135-159-21	TANTALUM CHIP 10uF 10% 20V	
C216	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C217	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C220	1-164-346-11	CERAMIC CHIP 1uF 16V	
C300	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C301	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C302	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C303	1-135-159-21	TANTALUM CHIP 10uF 10% 20V	
C304	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C305	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C306	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C307	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C308	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C309	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C310	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C311	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C400	1-124-778-00	ELECT CHIP 22uF 20% 6.3V	
C401	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C402	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C403	1-162-919-11	CERAMIC CHIP 22PF 5% 50V	
C404	1-162-924-11	CERAMIC CHIP 56PF 5% 50V	
C406	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C407	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C408	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C409	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C410	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C411	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C412	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C413	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C414	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C415	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C416	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C417	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C418	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	

Ref. No.	Part No.	Description	Remark
C419	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C426	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C427	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C428	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C429	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C430	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C431	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C432	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C433	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C434	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C435	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C436	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C500	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C501	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C502	1-164-473-11	CERAMIC CHIP 820PF 5% 50V	
C503	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
C504	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C505	1-164-505-11	CERAMIC CHIP 2.2uF 16V	
C506	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C507	1-164-343-11	CERAMIC CHIP 0.056uF 10% 25V	
C508	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C509	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C510	1-162-945-11	CERAMIC CHIP 22PF 5% 50V	
C513	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C514	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C515	1-124-779-00	ELECT CHIP 10uF 20% 16V	
C516	1-162-918-11	CERAMIC CHIP 18PF 5% 50V	
C517	1-162-917-11	CERAMIC CHIP 15PF 5% 50V	
C518	1-126-246-11	ELECT CHIP 220uF 20% 4V	
C519	1-124-779-00	ELECT CHIP 10uF 20% 16V	
C520	1-124-779-00	ELECT CHIP 10uF 20% 16V	
C521	1-124-779-00	ELECT CHIP 10uF 20% 16V	
C522	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C523	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C530	1-162-926-11	CERAMIC CHIP 82PF 5% 50V	
C999	1-135-161-21	TANTALUM CHIP 22uF 10% 10V	
		〈 CAP, ADJ 〉	
CV400	1-141-423-61	CAP, ADJ	
		〈 DIODE 〉	
D200	8-719-802-36	DIODE 1SS250	
D201	8-719-938-75	DIODE SB05-05CP	
D300	8-719-941-09	DIODE DAP202U	
⚠D301	8-719-421-27	DIODE MA728	
D302	8-719-941-09	DIODE DAP202U	
D400	8-719-800-56	LED TLUR164	
D500	8-719-420-81	DIODE MA3075WA	
D501	8-719-420-81	DIODE MA3075WA	
D502	8-719-106-80	DIODE RD13M-B2	

Ref. No.	Part No.	Description	Remark
D503	8-719-106-80	DIODE RD13M-B2	
D504	8-719-106-80	DIODE RD13M-B2	
D510	8-719-421-15	DIODE MA8027	
		〈 FERRITE BEAD 〉	
FB400	1-412-390-21	INDUCTOR CHIP 0uH	
FB401	1-412-390-21	INDUCTOR CHIP 0uH	
FB402	1-412-390-21	INDUCTOR CHIP 0uH	
FB403	1-412-390-21	INDUCTOR CHIP 0uH	
FB404	1-412-390-21	INDUCTOR CHIP 0uH	
FB405	1-412-390-21	INDUCTOR CHIP 0uH	
FB406	1-412-390-21	INDUCTOR CHIP 0uH	
FB407	1-412-390-21	INDUCTOR CHIP 0uH	
FB408	1-412-390-21	INDUCTOR CHIP 0uH	
		〈 IC 〉	
IC200	8-759-990-45	IC MB3775PFV	
IC300	8-759-512-69	IC S-81350HG-KD	
IC301	8-759-720-45	IC CAT35C202K	
IC302	8-759-946-03	IC S-8054ALR-LN-S	
IC303	8-759-999-02	IC TL1596CDB	
IC304	8-759-940-33	IC S-8052ALO-LG-S	
IC400	8-759-083-08	IC MB89794BPF-177	
IC500	8-759-083-11	IC LA7217M	
IC501	8-759-098-47	IC MB90075PF-122	
IC502	8-759-209-97	IC TC4S81F	
		〈 COIL 〉	
L200	1-424-522-21	COIL, CHOKE 10uH	
L201	1-424-522-21	COIL, CHOKE 10uH	
L202	1-408-790-00	INDUCTOR CHIP 120uH	
L203	1-424-524-21	COIL, CHOKE 47uH	
L400	1-412-979-21	INDUCTOR 1uH	
L401	1-412-031-11	INDUCTOR CHIP 47uH	
L500	1-406-452-11	COIL, OSC	
L501	1-412-031-11	INDUCTOR CHIP 47uH	
		〈 LINK, IC 〉	
⚠PS300	1-532-605-00	LINK, IC ICP-N10 (0.4A)	
		〈 TRANSISTOR 〉	
Q200	8-729-428-88	TRANSISTOR UN9113	
Q201	8-729-425-64	TRANSISTOR 2SD2216Q	
Q202	8-729-425-50	TRANSISTOR 2SB1462Q	
Q203	8-729-425-64	TRANSISTOR 2SD2216Q	
Q204	8-729-425-64	TRANSISTOR 2SD2216Q	
Q205	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q206	8-729-601-58	TRANSISTOR 2SC3053-C	
Q207	8-729-429-18	TRANSISTOR UN9213	
Q300	8-729-425-50	TRANSISTOR 2SB1462Q	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

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Ref. No.	Part No.	Description	Remark
Q301	8-729-425-64	TRANSISTOR 2SD2216Q	
⚠Q302	8-729-220-93	TRANSISTOR 2SK209-G	
⚠Q303	8-729-220-93	TRANSISTOR 2SK209-G	
Q304	8-729-429-18	TRANSISTOR UN9213	
Q305	8-729-425-64	TRANSISTOR 2SD2216Q	
Q306	8-729-220-93	TRANSISTOR 2SK209-G	
Q400	8-729-929-26	TRANSISTOR DTC114TE	
Q500	8-729-427-72	TRANSISTOR XP4501	
Q501	8-729-425-64	TRANSISTOR 2SD2216Q	
Q502	8-729-425-50	TRANSISTOR 2SB1462Q	
Q503	8-729-425-50	TRANSISTOR 2SB1462Q	
		〈 RESISTOR 〉	
R200	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R201	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R202	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R203	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R204	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R205	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R206	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R207	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R208	1-216-035-00	METAL CHIP 270 5% 1/10W	
R209	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R210	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R211	1-218-716-11	METAL CHIP 10K 0.50% 1/16W	
R212	1-218-749-11	METAL CHIP 240K 0.50% 1/16W	
R213	1-218-698-11	METAL CHIP 1.8K 0.50% 1/16W	
R214	1-216-818-11	METAL CHIP 560 5% 1/16W	
R215	1-218-708-11	METAL CHIP 4.7K 0.50% 1/16W	
R216	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R217	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R218	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R219	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R220	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R221	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R300	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R301	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R302	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R303	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R304	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R305	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R306	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R307	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R308	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R310	1-216-861-11	METAL CHIP 2.2M 5% 1/16W	
R311	1-216-861-11	METAL CHIP 2.2M 5% 1/16W	
R312	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R313	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R315	1-216-809-11	METAL CHIP 100 5% 1/16W	
R316	1-216-854-11	METAL CHIP 560K 5% 1/16W	
R317	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R318	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R400	1-216-819-11	METAL CHIP 680 5% 1/16W	
R401	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R402	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R403	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R404	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R405	1-216-864-11	METAL CHIP 0 5% 1/16W	
R406	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R407	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R408	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R409	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R410	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R411	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R412	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R413	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R414	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R415	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R416	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R417	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R418	1-216-864-11	METAL CHIP 0 5% 1/16W	
R420	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R421	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R422	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R423	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R424	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R425	1-216-846-11	METAL CHIP 120K 5% 1/16W	
R426	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R427	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R428	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R429	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R431	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R432	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R434	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R436	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R440	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R450	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R500	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R501	1-216-818-11	METAL CHIP 560 5% 1/16W	
R503	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R504	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R505	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R506	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R508	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R509	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R510	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R511	1-216-864-11	METAL CHIP 0 5% 1/16W	
R512	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R513	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R514	1-216-839-11	METAL CHIP 33K 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
R515	1-216-809-11	METAL CHIP 100 5% 1/16W	
R516	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R517	1-216-819-11	METAL CHIP 680 5% 1/16W	
R518	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R519	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R520	1-216-817-11	METAL CHIP 470 5% 1/16W	
R521	1-216-864-11	METAL CHIP 0 5% 1/16W	
R522	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R523	1-216-834-11	METAL CHIP 12K 5% 1/16W	

〈 NETWORK, RES 〉

Ref. No.	Part No.	Description	Remark
RB401	1-236-436-11	NETWORK, RES 100K	
RB402	1-236-424-11	NETWORK, RES 10K	
RB403	1-236-424-11	NETWORK, RES 10K	
RB405	1-236-412-11	NETWORK, RES 1.0K	
RB406	1-236-424-11	NETWORK, RES 10K	
RB407	1-236-424-11	NETWORK, RES 10K	
RB408	1-236-412-11	NETWORK, RES 1.0K	
RB409	1-236-412-11	NETWORK, RES 1.0K	
RB410	1-236-412-11	NETWORK, RES 1.0K	
RB411	1-236-424-11	NETWORK, RES 10K	
RB412	1-236-436-11	NETWORK, RES 100K	
RB413	1-236-424-11	NETWORK, RES 10K	

〈 SWITCH 〉

Ref. No.	Part No.	Description	Remark
S402	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (CHANNEL +)	
S403	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (ENTER)	
S404	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (▷)	
S405	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (◁)	
S406	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (▽)	
S407	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (△)	
S408	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (MENU)	
S414	1-570-114-11	SWITCH, SLIDE (INPUT SEL)	

〈 FLEXIBLE BOARD 〉

Ref. No.	Part No.	Description	Remark
W400	1-645-418-11	FP-569 FLEXIBLE BOARD	

〈 CRYSTAL 〉

Ref. No.	Part No.	Description	Remark
X400	1-579-550-11	VIBRATOR, CRYSTAL (32.768kHz)	
X401	1-578-689-21	VIBRATOR (8MHz)	
X500	1-578-690-11	VIBRATOR, CERAMIC (500kHz)	
X501	1-579-738-21	VIBRATOR, CRYSTAL (14.318MHz)	

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* A-7063-380-A TU-142 BOARD, COMPLETE

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〈 CAPACITOR 〉

Ref. No.	Part No.	Description	Remark
C100	1-163-036-00	CERAMIC CHIP 0.068uF 50V	
C101	1-163-036-00	CERAMIC CHIP 0.068uF 50V	
C102	1-163-036-00	CERAMIC CHIP 0.068uF 50V	
C103	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C104	1-162-921-11	CERAMIC CHIP 33PF 5% 50V	
C110	1-164-361-11	CERAMIC CHIP 0.047uF 16V	
C111	1-164-361-11	CERAMIC CHIP 0.047uF 16V	
C112	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C113	1-163-035-00	CERAMIC CHIP 0.047uF 50V	
C115	1-164-361-11	CERAMIC CHIP 0.047uF 16V	
C116	1-164-361-11	CERAMIC CHIP 0.047uF 16V	
C117	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C118	1-164-361-11	CERAMIC CHIP 0.047uF 16V	
C119	1-124-779-00	ELECT CHIP 10uF 20% 16V	
C120	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C121	1-164-360-11	CERAMIC CHIP 0.1uF 16V	
C122	1-164-361-11	CERAMIC CHIP 0.047uF 16V	
C124	1-135-149-21	TANTALUM CHIP 2.2uF 20% 6.3V	
C127	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C128	1-162-927-11	CERAMIC CHIP 100PF 5% 50V	
C129	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C130	1-162-918-11	CERAMIC CHIP 18PF 5% 50V	
C131	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C132	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C133	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C135	1-135-259-11	TANTALUM CHIP 10uF 20% 6.3V	
C139	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C141	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C142	1-135-166-21	TANTALUM CHIP 47uF 10% 10V	
C150	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C190	1-135-259-11	TANTALUM CHIP 10uF 20% 6.3V	
C192	1-162-974-11	CERAMIC CHIP 0.01uF 50V	

〈 CONNECTOR 〉

Ref. No.	Part No.	Description	Remark
CN100	1-573-366-21	CONNECTOR, FFC/FPC 26P	

〈 DIODE 〉

Ref. No.	Part No.	Description	Remark
D100	8-719-941-09	DIODE DAP202U	

〈 IF BLOCK 〉

Ref. No.	Part No.	Description	Remark
IF100	1-466-869-21	IF BLOCK (IFJ-450L)	

〈 JACK 〉

Ref. No.	Part No.	Description	Remark
J100	1-507-921-00	JACK (EXT ANT)	

〈 COIL 〉

Ref. No.	Part No.	Description	Remark
L101	1-412-031-11	INDUCTOR CHIP 47uH	
L102	1-412-944-11	INDUCTOR 2.7uH	
L104	1-412-031-11	INDUCTOR CHIP 47uH	
L105	1-412-952-11	INDUCTOR 12uH	

〈 LINK, IC 〉

Ref. No.	Part No.	Description	Remark
⚠PS100	1-576-123-21	LINK, IC CCP2E20 (0.8A)	

〈 TRANSISTOR 〉

Ref. No.	Part No.	Description	Remark
Q100	8-729-928-42	TRANSISTOR DTA143EE	
Q102	8-729-928-42	TRANSISTOR DTA143EE	
Q103	8-729-425-64	TRANSISTOR 2SD2216Q	
Q105	8-729-425-64	TRANSISTOR 2SD2216Q	
Q106	8-729-425-50	TRANSISTOR 2SB1462Q	
Q107	8-729-425-64	TRANSISTOR 2SD2216Q	
Q108	8-729-425-64	TRANSISTOR 2SD2216Q	
Q109	8-729-425-64	TRANSISTOR 2SD2216Q	
Q111	8-729-425-64	TRANSISTOR 2SD2216Q	

〈 RESISTOR 〉

Ref. No.	Part No.	Description				Remark
R022	1-216-864-11	METAL CHIP	0	5%	1/16W	
R100	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R101	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R102	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R103	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R104	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R109	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R110	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R111	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R114	1-218-344-11	METAL CHIP	7.5K	5%	1/16W	
R115	1-216-864-11	METAL CHIP	0	5%	1/16W	
R116	1-216-864-11	METAL CHIP	0	5%	1/16W	
R118	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R119	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R120	1-216-814-11	METAL CHIP	270	5%	1/16W	
R121	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R123	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R124	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R125	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R126	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R127	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R129	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R130	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R132	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R133	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R134	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R135	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R137	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R138	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R140	1-216-864-11	METAL CHIP	0	5%	1/16W	
R170	1-216-025-11	METAL CHIP	100	5%	1/16W	
R171	1-216-025-11	METAL CHIP	100	5%	1/16W	
R191	1-216-864-11	METAL CHIP	0	5%	1/16W	

〈 SWITCH 〉

Ref. No.	Part No.	Description	Remark
S100	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (CHANNEL -)	
S101	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (TIMER CLEAR)	
S102	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (TIMER REC)	
S103	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (TIMER CHECK)	

〈 TUNER, ET 〉

Ref. No.	Part No.	Description	Remark
⚠TU100	1-465-926-11	TUNER, ET (BT-HA301)	

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* A-7071-700-A VR-39 BOARD, COMPLETE

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〈 CAPACITOR 〉

Ref. No.	Part No.	Description				Remark
C501	1-126-395-11	ELECT	22uF	20%	16V	
C502	1-162-974-11	CERAMIC CHIP	0.01uF		50V	

〈 CONNECTOR 〉

Ref. No.	Part No.	Description	Remark
CN501	1-580-056-21	PIN, CONNECTOR 3P	
CN502	1-573-923-21	CONNECTOR, FFC/FPC (ZIF) 14P	
CN503	1-573-921-11	CONNECTOR, FFC/FPC (ZIF) 12P	

〈 COIL 〉

Ref. No.	Part No.	Description	Remark
L501	1-412-028-11	INDUCTOR CHIP 4.7uH	

〈 RESISTOR 〉

Ref. No.	Part No.	Description				Remark
R501	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R502	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R503	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R504	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R505	1-216-833-11	METAL CHIP	10K	5%	1/16W	

〈 SWITCH 〉

Ref. No.	Part No.	Description	Remark
S501	1-572-473-11	SWITCH, TACTIL (VOL +)	
S502	1-572-473-11	SWITCH, TACTIL (VOL -)	
S503	1-572-473-11	SWITCH, TACTIL (BRT +)	
S504	1-572-473-11	SWITCH, TACTIL (BRT -)	
S505	1-572-473-11	SWITCH, TACTIL (MENU)	
S506	1-572-473-11	SWITCH, TACTIL (ENTER)	

〈 FLEXIBLE BOARD 〉

Ref. No.	Part No.	Description	Remark
W501	1-645-365-11	FP-564 FLEXIBLE BOARD	

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The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS *************	
62	1-645-364-11	FP-563 FLEXIBLE BOARD	
63	1-645-368-11	FP-568 FLEXIBLE BOARD	
⚠69	1-466-791-11	INVERTER UNIT, DC/AC (DPS-28)	
101	1-645-995-11	FP-629 FLEXIBLE BOARD	
110	1-645-367-11	FP-566 FLEXIBLE BOARD	
112	1-645-366-11	FP-565 FLEXIBLE BOARD	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
251	A-7049-568-A	DRUM ASSY, UPPER (DGR-93-R)	
361	1-501-456-11	ANTENNA, TELESCOPIC	
BL901	1-517-126-11	FLUORESENT TUBE, HEAT CATHODE	
J401	1-569-556-11	JACK (VIDEO/AUDIO)	
J901	1-537-449-11	TERMINAL BOARD (TUNER/CAMERA)	
J902	1-537-420-21	TERMINAL BOARD (BATTERY)	
J903	1-580-009-21	SOCKET, CONNECTOR (SQUARE) 12P (A/V OUT)	
LCD901	1-809-500-11	MODULE, COLOR LIQUID CRYSTAL	
M901	A-7048-635-A	DRUM ASSY (DGH-93A-R)	
M902	8-835-492-01	MOTOR, DC SCE-0102A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	
S005	1-570-771-21	SWITCH (C DOWN)	
SP901	1-504-137-11	SPEAKER (3.6CM)	

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Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS ********************************	
	1-417-173-11	DISTRIBUTOR, ANTENNA	
	1-528-174-31	BATTERY, LITHIUM (CR2032 TYPE)	(US)
	3-316-688-01	BAG, PROTECTION	
	3-755-611-21	MANUAL, INSTRUCTION (ENGLISH)	(US)
	3-755-611-31	MANUAL, INSTRUCTION (FRENCH)	(Canadian)
	3-755-628-21	MANUAL, INSTRUCTION (ENGLISH)	(US)
	3-755-628-31	MANUAL, INSTRUCTION (ENGLISH, FRENCH)	(Canadian)
*	3-949-755-01	INDIVIDUAL CARTON	
*	3-949-756-01	CUSHION (LOWER)	
*	3-949-758-01	CUSHION, ACC	
	8-953-314-95	HEADPHONE MDR-E757/BK SET	

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Ref. No.	Part No.	Description	Remark
		HARDWARE LIST *************	
#1	7-624-102-04	STOP RING 1.5, TYPE -E	
#2	7-627-853-57	PRECISION SCREW +P2X5	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

SECTION 7
MECHANICAL SECTION ADJUSTMENTS

Mechanism Section Adjustments

For details of adjustments and checks of the mechanism section, and the replacement of mechanism parts, refer to the separate volume "8 mm Video MECHANISM ADJUSTMENT Manual IV A MECHANISM " (9-973-199-11).
Refer to the following for how to set the track shift mode.

7-1. SETTING OF TRACK SHIFT MODE

1) Refer to "2. DISASSEMBLY", and supply the power with the cabinet section removed. (So that the mechanism deck section can be operated.)
2) Connect the adjusting remote commander, and turn on the HOLD switch.
3) Select page: 1, address: 00, and set data: 01.
   (Releasing the protect.)
4) Select page: D, address: 01, and set data: 03.
   (Setting the track shift mode.)
5) Press the PAUSE button of the adjusting remote commander.
6) Turn off the HOLD switch of the adjusting remote commander. (The adjusting remote commander can be removed after this.)
7) After completing all operations, be sure to perform "7-3. Processing After Operations".

7-2. PREPARATIONS FOR ADJUSTMENTS

1) Clean the tape path face (tape guide, drum, capstan shaft, pinch roller).
2) Connect the oscilloscope.
   CH1: Pin ② of CN053 on RP-144 board (V RF OUT)
   CH2: Pin ③ of CN053 on RP-144 board (RF SW P)
3) Play back the alignment tape for adjusting tracking (WR5-1NP: 8-967-995-02).
4) Check that the RF waveform of the oscilloscope is flat at the entrance and exit. (Refer to Figs. 7-1, 7-2.)
   If not flat, perform necessary adjustment according to the separate 8 mm Video Mechanical Adjustment IV (A Mechanism).
5) After adjusting, perform "7-3. Processing After Operations".

7-3. Processing After Operations

1) Connect the adjusting remote commander, and turn on the HOLD switch.
2) Select page: 1, address: 00, and set data: 01.
3) Select page: D, address: 01, and set data: 00.
4) Press the PAUSE button of the adjusting remote commander.
5) Disconnect the power supply of the unit.

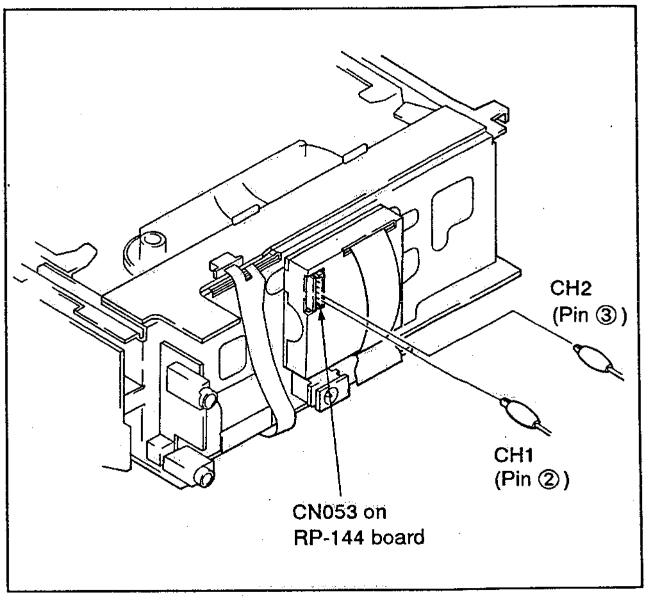


Fig.7-1.

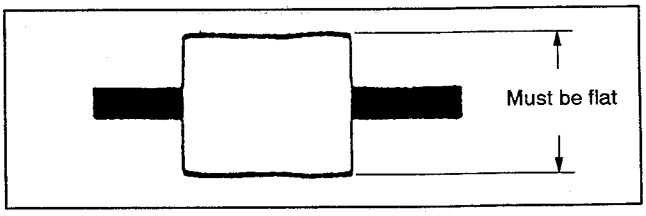


Fig.7-2.

SECTION 8
ELECTRICAL ADJUSTMENTS

When adjusting, refer to the layout diagrams for adjustment related parts beginning from page 206.

8-1. PREPARATIONS BEFORE ADJUSTMENTS

Use the following measuring equipments for adjusting the video section.

8-1-1. Equipments Used

1) TV Monitor
2) Oscilloscope 2 phenomena, band 30 MHz or wider, with delay mode (Use 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Regulated power supply
11) Alignment tape
    For adjusting tracking (WR5-1NP)
    Part code: 8-967-995-02
    For adjusting video frequency characteristics (WR5-7NE)
    Part code: 8-967-995-13
    For checking operations
    (WR5-4NL)Note 1
    Part code: 8-967-995-51
    (WR5-5NSP)Note 2
    Part code: 8-967-995-42
    (WR5-8NSE)
    Part code: 8-967-995-43
    For checking AFM stereo operations (WR5-9NS)
    Part code: 8-967-995-23
    Note: 1) The WR5-3NL (8-967-995-31) alignment tape can be used instead.
    2) The WR5-4NSP (8-967-995-41) alignment tape can be used instead.
12) Adjusting remote commander (J-6082-053-A)
    Note: If the micro processor IC in the adjusting remote commander is not the new model (μPD7503G-C56-12), pages cannot be switched. Therefore, replace with the new one (8-759-148-35).

8-1-2. Connecting the Equipments

Connect the measuring equipments as shown in Fig. 8-1 and adjust, unless specified otherwise.

- Connect the adjusting remote commander to the remote control terminal (J101 on MA-137 board).

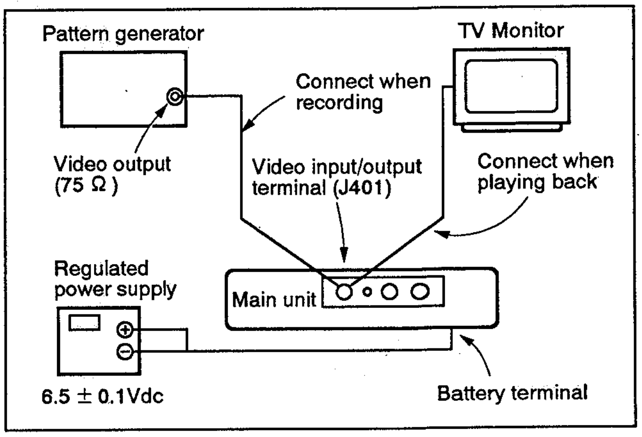

Pattern generator
TV Monitor
Connect when recording
Video output (75 Ω)
Video input/output terminal (J401)
Connect when playing back
Regulated power supply
Main unit
6.5 ± 0.1Vdc
Battery terminal

Fig. 8-1.

8-1-3. Precautions Upon Adjustments

1) The LCD unit is not required except in the "LCD system adjustment". Remove it when not required.

8-1-4. Setup during Adjustment

Because the video signal obtained from the pattern generator is used as the adjustment signal for electrical adjustments, it must satisfy the given specifications.

Connect the oscilloscope to the video input/output terminal of the AU-136 board, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and the level ratio of the burst signal to the "red"

signal is 0.30: 0.66. The video signal (color bar) used in electrical adjustments is shown in Fig. 8-2.

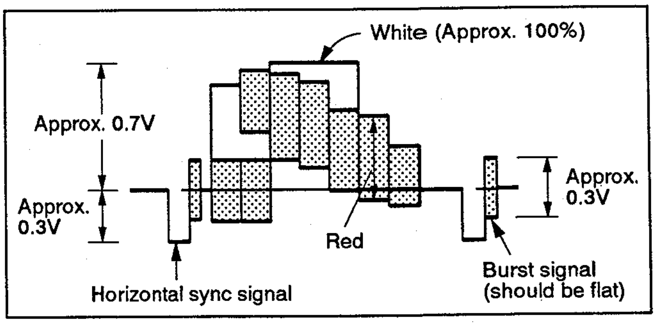

White (Approx. 100%)
Approx. 0.7V
Approx. 0.3V
Red
Approx. 0.3V
Horizontal sync signal
Burst signal (should be flat)

Fig. 8-2. Color Bar Signal of Pattern Generator

8-1-5. Alignment Tape

The following table lists available alignment tapes.
Use the tape specified in the signal column for each adjustment.

If the tape type is not specified for adjustments using tapes to check operations, use whichever tape for checking operations.

Name	Recording Mode	Tape Type	Tape Speed	Recording Contents		Uses
				Video Area	PCM Area	
Tracking WR5-1NP	L	MP	SP	CH2: 1 MHz tape path adjusting signal		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-7NE	E	ME	SP	RF sweep 0 to 15 MHz Marker 2, 4.5, 7, 8.5, 10 MHz		Adjusting frequency characteristics
Checking operations (SP mode) WR5-5NSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20Hz, 20 sec. 400Hz, 20 sec. } Repeated 4 times 14kHz, 20 sec. Color bar section 1 kHz, 4 minutes	Checking operations
Checking operations (LP mode) WR5-4NL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		
Checking operations (Hi8 SP mode) WR5-8NSE	E	ME	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) 400 Hz	
Checking AFM stereo operations WR5-9NS	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) Stereo section (Color bar) Lch: 400 Hz, Rch: 1 kHz (L+R: 1.5 MHz ± 60 kHz DEV L–R: 1.7 MHz ± 30 kHz DEV) Bilingual section (Monoscope) MAIN: 400 Hz (1.5 MHz ± 60 kHz DEV) SUB: 1 kHz (1.7 MHz ± 30 kHz DEV)	• Audio signal (PCM) 400 Hz, 8 minutes	Checking AFM stereo operations

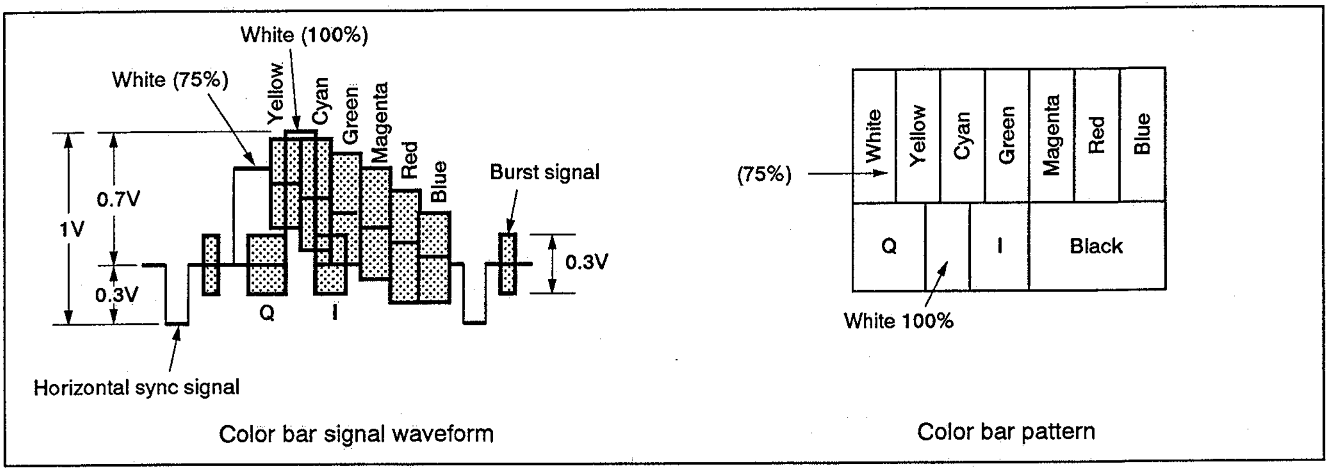
Note: Recording mode
L ··············· Conventional mode
E ··············· Hi8 (Hi-band) mode

Tape types
MP············· Metal particle tape
ME············· Metal evaporated tape

Table 8-1.

The 75% color bar signal recorded on the alignment tape is shown in Fig. 8-3.

Note: Measured at the video input/output terminal (terminated at 75 Ω)


White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst signal
0.7V
1V
0.3V
0.3V
Q
I
Horizontal sync signal
(75%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Q
I
Black
White 100%

Color bar signal waveform

Color bar pattern

Fig. 8-3. Alignment Tape Color Bar Signal

8-1-6. Input/Output Level and Impedance

Video input	Pin jack Input signal: 1 Vp-p, 75Ω unbalanced, sync negative
Video output	Pin jack Output signal: 1 Vp-p, 75Ω unbalanced, sync negative
Audio input	Pin jack Input level: –7.5 dBs (0 dBs=0.775 Vrms) Input impedance: Above 47 kΩ
Audio output	Pin jack Standard output: –7.5 dBs Output impedance: Below 10 kΩ

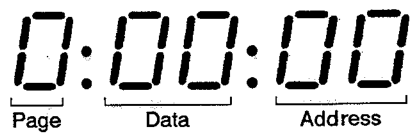
8-1-7. Service Mode

1. Service Mode Setting

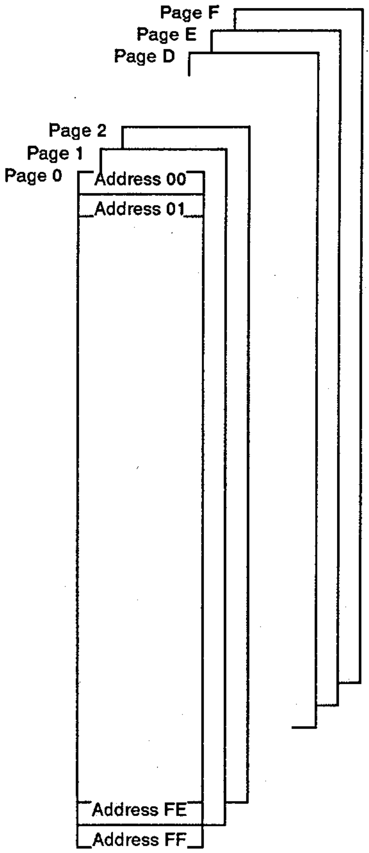
The service mode consists of the adjusting mode which adjusts the EVR and the test mode which displays the condition of the unit.

The unit can be set into the test mode and adjusting mode by connecting the adjusting remote commander (Set the HOLD switch to "HOLD").

LCD Display of the Adjusting Remote Controller

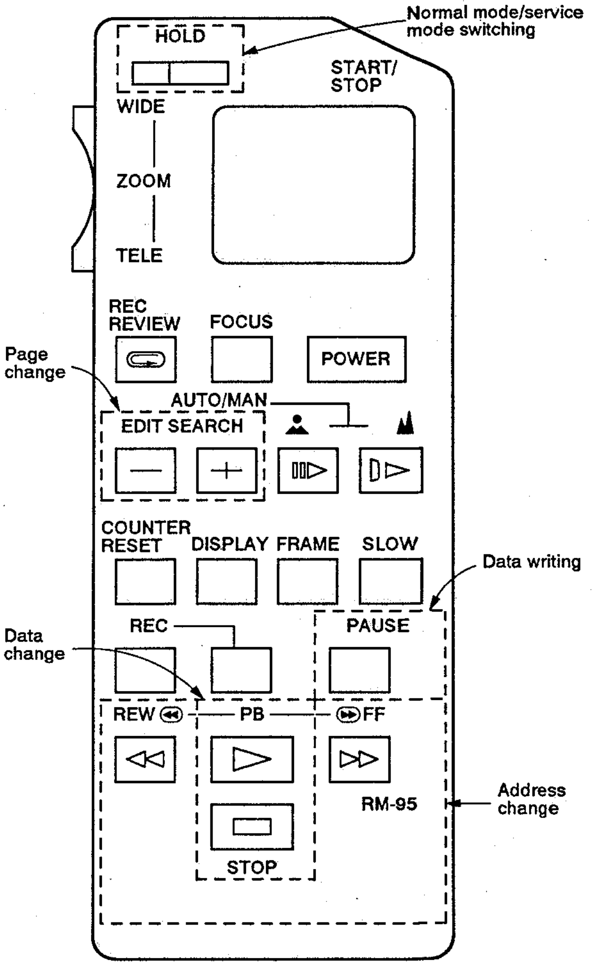

0:00:00
Page
Data
Address

(1) Service LANC memory map

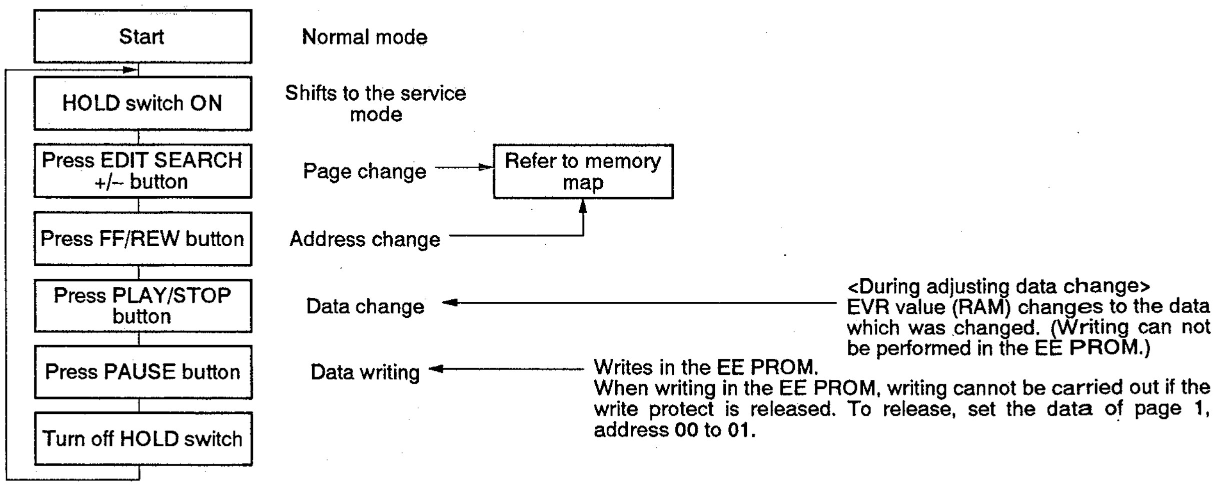

Page F
Page E
Page D
Page 2
Page 1
Page 0
Address 00
Address 01
Address FE
Address FF

Page	Page Division
0	
1	Shared by VTR section
2	Mode controller
3	Mechanism controller
4	
5	
6	
7	
8	
9	
A	
B	
C	EE-PROM
D	EE-PROM
E	
F	

Adjusting remote commander RM-95 (J-6082-053-A)


Normal mode/service mode switching
HOLD
START/ STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
Page change
AUTO/MAN
EDIT SEARCH
—
+
COUNTER RESET
DISPLAY
FRAME
SLOW
Data writing
REC
PAUSE
Data change
REW
PB
FF
RM-95
Address change
STOP

[Shifting to the service mode using the adjusting remote commander]


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press EDIT SEARCH +/– button
Page change
Refer to memory map
Press FF/REW button
Address change
Press PLAY/STOP button
Data change
Press PAUSE button
Data writing
Turn off HOLD switch

<During adjusting data change>
EVR value (RAM) changes to the data which was changed. (Writing can not be performed in the EE PROM.)

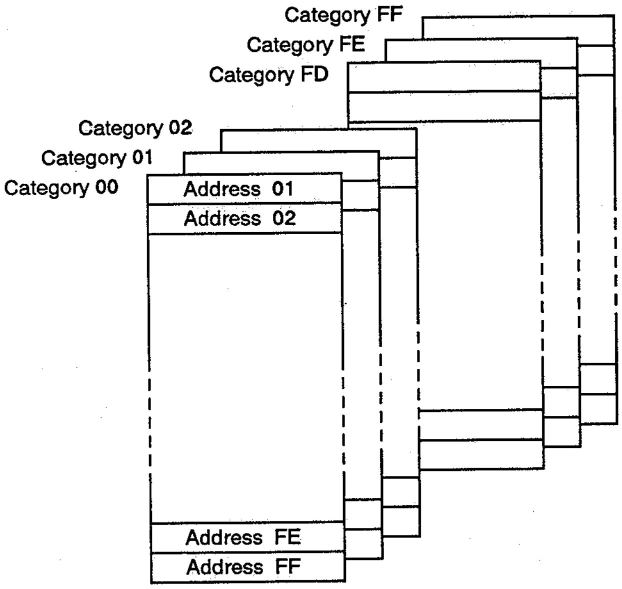
Writes in the EE PROM.
When writing in the EE PROM, writing cannot be carried out if the write protect is released. To release, set the data of page 1, address 00 to 01.

Command Name	Command Function	Normal LANC Command
Page Up	Page+1	Edit Search+
Page Down	Page–1	Edit Search –
Direct Page Set	Sets to the specified page	Event Clear
Address Up	Address+1	Fast Forward
Address Down	Address–1	Rewind
Data Up	Data+1	Play Back
Data Down	Data–1	Stop
Store	Writes data in the EEPROM, RAM	Pause

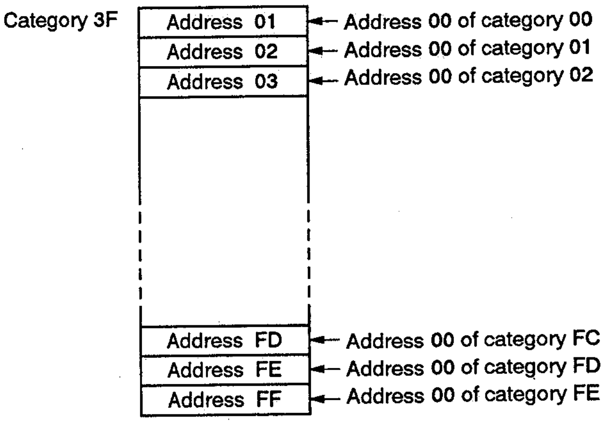
(2) Category Codes

This unit uses category codes for pages 2 and 3. The 256 addresses from 00 to FF are insufficient for the mode controller and mechanism controller to access the RAM. Therefore, new category codes have been used to seemingly increase addresses (Addresses 0000 to FFFF).

However, the data of address 00 are actually used as page numbers to form the 256 pages from 00 to FF, as shown in the following figure. These address 00 data are called category codes to discriminate them from the real page numbers. The new pages are called categories.


Category FF
Category FE
Category FD
Category 02
Category 01
Category 00
Address 01
Address 02
Address FE
Address FF

(Supplement) As each category no longer has address 00 as it is, this address cannot be accessed using the adjusting remote commander. Therefore, category 3F is used for accessing address 00.


Category 3F
Address 01
Address 02
Address 03
Address FD
Address FE
Address FF
Address 00 of category 00
Address 00 of category 01
Address 00 of category 02
Address 00 of category FC
Address 00 of category FD
Address 00 of category FE

(Example)

Specification of

Page 2	Category 01	Address 16

Page 2 is the mode controller

Page 3 is the mechanism controller

The actual category and address are specified by the adjusting remote commander as follows.

Order	Page	Address	Data	Procedure
1	2	00	01	Select category 01 using the data of page 2, address 00. From here onwards, category 01 will be selected at page 2 until the data of page 2, address 01 is rewritten.
2	2	16		As the data of page 2, address 00 is 01, select page 2, address 16 to select page 2, category 01, address 16. (The data of this address is the A/D conversion value of the input voltage of Pin (82) of the mode controller.)

2. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Write protect release

3. Test Mode Setting

Set/release various test mode. Release the protect (page: 1, address: 00, data: 01) before setting the data.

Page D	Address 01

Data	Function
00	Normal
01	Test mode 1 Various emergency prohibitions and releases Drum, capstan, loading motor, reel, tape top and end, DEW SP/LP automatic discrimination prohibition, manual switching 5 minutes pause release prohibition Power off prohibition/release by battery end
02	Test mode 2 Not used
03	Test mode 3 Track shift Performs the track shift playback Rear lock discrimination prohibition during PB SP/LP automatic discrimination prohibition, manual switching
04	Test mode 4 Rear lock mode Performs rear lock playback SP/LP automatic discrimination prohibition, manual switching

※ The data of these addresses can be recorded in the nonvolatile memory by pressing the PAUSE button on the adjusting remote commander. Take note that, in this case, the test mode will not be released even if the main power supply (6.5 Vdc) has been turned off.

※ Be sure to return the data of this address to 00 after adjustments/repairs.

4. Emergency code

Fault (error) symptoms can be checked.

Page D	Address 06

First emergency code

······The first error code generated

Page D	Address 07

Last emergency code

······The last error code generated (This data will be renewed each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after repairs/adjustments.

※ When rewriting the data, be sure to press the PAUSE button of the adjusting remote commander after setting the data.

Code	Error Condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Reel errors at other times
04	Capstan error
05	FG error during drum start up
06	PG error during drum start up
07	FG error when drum is normal
08	PG error when drum is normal
09	Phase error when drum is normal

5. Emergency mode

The operation mode set when the error occurred can be checked

Page D	Address 08

First emergency mode
……The operation mode set when the first error occurred

Page D	Address 09

Last emergency mode
……The operation mode set when the last error occurred
(This data will be renewed each time an error occurs.)

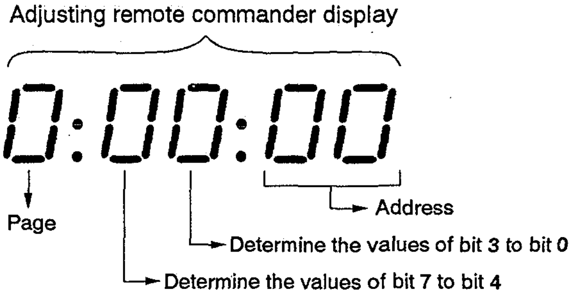
Code	Error Conditions
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
36	–X1
37	–1/5 SLOW
46	CUE
47	1/10 SLOW
56	REVIEW
57	–1/10 SLOW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
76	–X2
77	–FRAME
83	REWIND
85	REC REVIEW (+)
95	REC REVIEW (–)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH (–)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

※ Be sure to rewrite the data of addresses 08 and 09 to 00 after repairs/adjustments.

※ When rewriting the data, be sure to press the PAUSE button of the adjusting remote commander after setting the data.

6. Bit Value Discrimination

Bit values must be discriminated using the display data of the adjusting remote commander for the following items. Use the table below to discriminate if the bit value is "1" or "0".


Adjusting remote commander display
0:00:00
Page
Address
Determine the values of bit 3 to bit 0
Determine the values of bit 7 to bit 4

Remote controller display	Bit value			
	bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
Ⓐ→ 8	1	0	0	0
9	1	0	0	1
A(A)	1	0	1	0
B(b)	1	0	1	1
C(c)	1	1	0	0
D(d)	1	1	0	1
Ⓑ→ E(E)	1	1	1	0
F(F)	1	1	1	1

(Example) If the remote commander display data is "8E", bit values from bit 7 to bit 4 can be discriminated from column Ⓐ, and those from bit 3 to bit 0 from column Ⓑ.

7. Key input check

Page 2	Category 3F	Address 01

Bit	Key Switch	Condition of Switch
0		"1"=OFF "0"=ON
1	PACK DET	
2	Cassette eject (PE-13, S201)	
3	Power supply (PE-13, S202)	
4		
5		
6	CC DOWN (Mechanism section)	
7		

Using method:

Order	Page	Address	Data	Procedure
1	2	00	3F	Specification of category 3F
2	2	01		The on/off of each key switch can be discriminated by discriminating the bit values of the display data.

Page 2	Category 00	Address 0E

Bit	Switch	Condition of Switch
0		
1		
2		
3		
4		
5		
6	LINE STEREO	Audio input/output terminal (right), "1"=Connected, "0"=Open
7		

Using method:

Order	Page	Address	Data	Procedure
1	2	00	00	Specification of category 00
2	2	0E		The on/off of the switches can be discriminated by discriminating the bit values of the display data.

Page 2	Category 00	Address 1C

Bit	Switch	Condition of Switch
3	LCD ON/OFF (PE-13, S206)	"1"=ON, "0"=OFF

Using method:

Order	Page	Address	Data	Procedure
1	2	00	00	Specification of category 00
2	2	1C		The on/off of the switches can be discriminated by discriminating the bit values of the display data.

8. Key input check (A/D Port)

Page 2	Category 01	Address 16 – 18

Display Data Address	Approx. 00	Approx. 2D	Approx. 4C	Approx. 70	Approx. 8E	Approx. B2	Approx. FF
16 (KEY AD IN 0 IC201 (82))	REC (FU-109, S301)	STOP (FU-109, S302)	FF (FU-109, S303)	PLAY (FU-109, S304)	SLOW (FU-109, S305)		No key input
17 (KEY AD IN 1 IC201 (83))	PAUSE (FU-109, S306)	REW (FU-109, S307)	COUNTER RESET (PE-13, S203)	DATA SCREEN (PE-13, S204)			No key input
18 (KEY AD IN 2 IC201 (84))	VOLUME + (VR-39, S501)	VOLUME – (VR-39, S502)	BRIGHT+ (VR-39, S503)	BRIGHT – (VR-39, S504)	MENU (VR-39, S505)	ENTER (VR-39, S506)	No key input

Using method:

Order	Page	Address	Data	Procedure
1	2	00	01	Specification of category 01
2	2	16–18		The key pressed can be discriminated by the display data of each address.

9. Battery voltage check

Page 3	Category 02	Address 10

Display Data	Battery Voltage
FF	Approx. 10 Vdc
F0	Approx. 9.4 Vdc
E0	Approx. 8.8 Vdc
D0	Approx. 8.2 Vdc
C0	Approx. 7.5 Vdc
B0	Approx. 6.9 Vdc
A0	Approx. 6.3 Vdc
90	Approx. 5.6 Vdc
80	Approx. 5.0 Vdc

Using method:

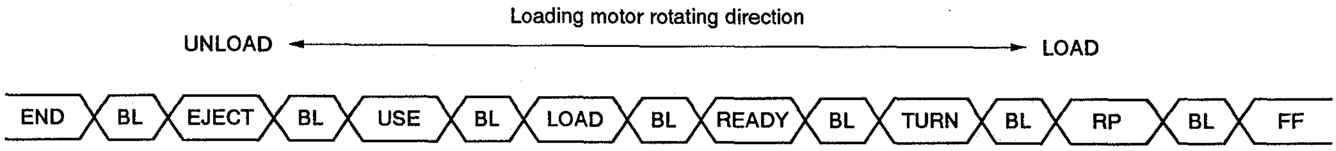
Order	Page	Address	Data	Procedure
1	3	00	02	Specification of category 02
2	3	10		The battery voltage can be discriminated by the display data.

10. Mechanism section switch, etc. check

Page 2	Category 00	Address 86

Bit	Switch, etc.	Condition
0	HG/$\overline{\text{NOR}}$	"1"=Hi8 MP tape, "0"=Others
1	E DET	"1"=Hi8 mode playback, "0"=Others
2	ME/$\overline{\text{MP}}$ SW	"1"=ME tape, "0"=MP tape
3	REC PROOF	"1"=Recording prohibited, "0"=Recording possible
4		
5	MODE SW 2	Refer to the following table.
6	MODE SW 1	
7	MODE SW 0	

Display Data	MODE SW 0	MODE SW 1	MODE SW 2	Mechanism Position	Function	$\overline{\text{CC DOWN}}$
0	0	0	0	BL	Interval between each position	
6	0	1	1	END	FULL END processing (Releasing the T side lock.)	1
2	0	0	1	EJECT	Eject position of cassette compartment	1
A	1	0	1	USE	EJECTED (Unskate end)	1
2	0	0	1	LOAD	LOADING (Skate in)	0
8	1	0	0	READY	NORMAL STOP position	0
C	1	1	0	TURN	Only pinch roller turns off during PB ↔ REV (oscillating position)	0
4	0	1	0	RP	PB, REC, RVS, REV, REW, CUE	0
0	0	0	0	FF	FF	0



Using method:

Order	Page	Address	Data	Procedure
1	2	00	00	Specification of category 00
2	2	86		The mode switch position can be discriminated by the upper digit of the display data. The condition of each switch can be discriminated by the bit value of the lower digit.

11. Mechanism controller input/output check

Page 2	Category 00	Address 85

Bit	I/O Signal	Condition
0	PB LP/SP DET	"1"=LP playback, "0"=Others
1	SYNC DET	"1"=VTR SYNC present, "0"=No VTR SYNC
2	REC CLOG	"1"=Clog occurred, "0"=Others
3		
4	JOG	"1"=Variable speed playback, "0"=Others
5	VA PB MODE	"1"=Playback mode, "0"=E-E mode
6	AUDIO MUTE	"1"=Mute, "0"=Audio output
7	VIDEO MUTE	"1"=Mute, "0"=Video output

Using method:

Order	Page	Address	Data	Procedure
1	2	00	00	Specification of category 00
2	2	85		The condition of each input/output signal can be discriminated by the bit value of the display data.

12. Mechanism controller A/D Port input voltage check

Page 3	Category 02	Address 14

Display Data	A/D Port Input Voltage
00 to FF	Approx. 0 Vdc to approx. 5 Vdc

Using method:

<table>
<tr><th>Order</th><th>Page</th><th>Address</th><th>Data</th><th>Procedure</th></tr>
<tr><td>1</td><td>3</td><td>00</td><td>02</td><td>Specification of category 02</td></tr>
<tr><td>2</td><td>3</td><td>0E</td><td>02</td><td>Permission for A/D conversion operations</td></tr>
<tr><td>3</td><td>3</td><td>13</td><td></td><td>Set the data according to the following table, and specify the A/D port of the mechanism controller.
<table>
<tr><th>Data</th><th>Mechanism Controller Port</th></tr>
<tr><td>00</td><td>Pin (60);AN0, T REEL FG</td></tr>
<tr><td>01</td><td>Pin (59);AN1, S REEL FG</td></tr>
<tr><td>02</td><td>Pin (58);AN2, ATF ERROR</td></tr>
<tr><td>03</td><td>Pin (57);AN3, BATT SENS</td></tr>
<tr><td>04</td><td>Pin (56);AN4, $\overline{\text{DEW DET}}$</td></tr>
<tr><td>05</td><td>Pin (55);AN5, TAPE TOP</td></tr>
<tr><td>06</td><td>Pin (54);AN6, TAPE END</td></tr>
</table></td></tr>
<tr><td>4</td><td>3</td><td>14</td><td></td><td>The A/D port input voltage can be discriminated according to the display data.</td></tr>
</table>

13. Tape top/end sensor check

Page 3	Category 02	Address 0A

Display Data	Tape Top/End Sensor Condition
0 0	Tape present (Middle of tape)
0 1	Tape top
1 0	Tape end
1 1	No tape

Tape end sensor condition
Tape top sensor condition

"0"=Non active (Not receiving light)
"1"=Active (Receiving light)

Using method:

Order	Page	Address	Data	Procedure
1	3	00	02	Specification of category 02
2	3	0E	10	Request for tape top/end sampling operations
3	3	0A		The condition of the tape top/end sensor can be discriminated by the display data.

14. Individual operations of drum, capstan, and loading motor

Page 2	Category 02	Address 11

Data	Operations
00	Normal
02	Drum in normal rotation
04	Drum in reverse rotation
06	Capstan in normal rotation
08	Capstan in reverse rotation
0A	Loading motor in normal rotation
0C	Loading motor in reverse rotation
01	All motors stop
03	
05	
07	
09	
0B	
0D	
0F	

Using method:

Order	Page	Address	Data	Procedure
1	3	00	02	Specification of category 02
2	3	0E	01	Permission for individual operations of motor
3	3	11		The motor can be operated individually by setting the data indicated above.
4				Turn off the main power supply (6.3 Vdc).

15. Page D Address List

Address	Name	Function ( ) contains the adjustment voltage output terminal	Adjustment data	
			Initial level	Memo column
00	Category code		00	00
01	Test mode		00	00
02			05	05
03	BATT END DATA	Battery end adjustment	80	
04	SW POS ADJ DATA LOW	Switching position adjustment (Fine adjustment)	80	
05	SW POS ADJ DATA HIGH	Switching position adjustment (Rough adjustment)	0A	
06	EMERGENCY CODE FIRST	Error codes and modes are recorded in the memory. Rewrite the data of these addresses to 00 after repairs/adjustments.	00	00
07	EMERGENCY CODE LAST		00	00
08	EMERGENCY MODE FIRST		00	00
09	EMERGENCY MODE LAST		00	00
0A	VIDEO DATA MP SP	CXA1207 serial data	6A	6A
0B	VIDEO DATA MP LP	CXA1207 serial data	55	55
0C	VIDEO DATA MP SP HI8	CXA1207 serial data	6A	6A
0D	VIDEO DATA MP LP HI8	CXA1207 serial data	55	55
0E	VIDEO DATA ME SP	CXA1207 serial data	6A	6A
0F	VIDEO DATA ME LP	CXA1207 serial data	55	55
10	VIDEO DATA ME SP HI8	CXA1207 serial data	6A	6A
11	VIDEO DATA ME LP HI8	CXA1207 serial data	55	55
12	VIDEO DATA EDIT	CXA1207 serial data	6A	6A
13	VIDEO DATA EDIT HI8	CXA1207 serial data	55	55
14 to 17		Not used		
18	SLOW TRACON SP	"Slow tracking adjustment (SP mode)" (Note 1)	00	00
19	SLOW TRACON LP	"Slow tracking adjustment (LP mode)" (Note 1)	00	00
1A	HP VOL	"Volume" adjustment center value (IC206 ③)	80	80
1B	BRIGHT	"Brightness" adjustment center value(IC906 ⑤)	80	80
1C	COLOR	"Color" adjustment (IC906 ⑨) (Note 1)	80	80
1D	HUE	"Hue" adjustment (IC906 ⑫) (Note 1)	80	80
1E	MENU DATA 1	(Note 1)	00	00
1F	MENU DATA 1	(Note 1)	00	00
20	SET VARIATION		00	00
21	ADJUST MODE		00	00
22 to 2C		Not used		
2D	BATT REMAIN LOW	Battery end adjustment	95	
2E	BATT REMAIN MIDDLE	Battery end adjustment	9B	
2F	BATT REMAIN FULL	Battery end adjustment	9F	
30	REC C	REC C level adjustment (IC705 ⑧)	B0	
31 to 35		Not used		
36	M TUNE 1CH	Playback frequency characteristics adjustment (IC206 ⑤)	AA	
37 to 3D		Not used		
3E	M TUNE 2CH	Playback frequency characteristics adjustment (IV206 ⑥)	AA	
3F to 47		Not used		
48	RF CONT ME		AB	AB
49	RF CONT MP		C7	C7

Table 8-2 (1).

Note 1: User control (Adjust or set on the menu display.)

Address	Name	Function ( ) contains the adjustment voltage output terminal	Adjustment data	
			Initial level	Memo column
4A	SYNC AGC	SYNC AGC adjustment (IC705 ⑱)	7A	
4B		Not used		
4C	C COMB ADJUST	Y/C separation adjustment (IC705 ②)	AA	
4D	IR	IR adjustment (IC705 ②)	AA	
4E	CAR HI8	(IC705 ④)	50	50
4F	CAR	Y FM carrier frequency adjustment (IC705 ④)	A5	
50	DEVIATION HI8	(IC705 ⑤)	50	50
51	DEVIATION	Y FM deviation adjustment (IC705 ⑤)	90	
52	REC Y HI8 ME	(IC705 ⑥)	D0	D0
53	REC Y HI8 MP	(IC705 ⑥)	D0	D0
54	REC Y	REC Y level adjustment (IC705 ⑥)	A0	
55		Not used		
56	REC Y PB		00	00
57	DEEMPH Y REC		90	90
58	DEEMPH Y PB	DEEMPH Y level adjustment (IC705 ⑦)	70	
59		Not used		
5A	EMPH/PB Y REC	EMPH Y level adjustment (IC705 ③)	A5	
5B	EMPH/PB Y PB	PB Y level adjustment (IC705 ③)	AA	
5C to 63		Not used		
64	PILOT CONT ME		C0	C0
65	PILOT CONT MP		90	90
66		Not used		
67	PAL JOG	Not used (IC705 ⑨)	FF	FF
68 to 77		Not used		
78	1.5 DEV PB	1.5 MHz playback level adjustment (IC206 ⑲)	A0	
79	1.7 DEV PB	1.7 MHz playback level adjustment (IC206 ②)	80	
7A	1.5 IR	1.5 MHz carrier frequency adjustment (IC206 ⑱)	A0	
7B	1.5 DEV REC	1.5 MHz deviation adjustment (IC206 ⑲)	80	
7C	1.7 IR	1.5 MHz carrier frequency adjustment (IC206 ④)	A0	
7D	1.7 DEV REC	1.5 MHz deviation adjustment (IC206 ②)	80	
7E to 83		Not used		
84	R BRT	R sub-bright adjustment (IC906 ②)	A8	
85	G BRT	G sub-bright adjustment (IC906 ③)	A8	
86	B BRT	B sub-bright adjustment (IC906 ④)	A8	
87	B COM	B sub-bias adjustment (IC906 ⑥)	A8	
88	R COM	R sub-bias adjustment (IC906 ⑦)	A8	
89	COM	RGB bias adjustment (IC906 ⑧)	A8	
8A	GAIN	Contrast adjustment (IC906 ⑲)	A8	
8B	R GAIN	R contrast adjustment (IC906 ⑱)	A8	
8C	B GAIN	B contrast adjustment (IC906 ⑬)	A8	
8D	CAP FG DUTY	CAF FG duty adjustment (IC206 ⑧)	80	
8E	(RF CONT ME)	Not used		
8F	(RF CONT MP)	Not used		

Table 8-2 (2).

Address	Name	Function ( ) contains the adjustment voltage output terminal	Adjustment data	
			Initial level	Memo column
90	(PILOT CONT ME)	Not used		
91	(PILOT CONT MP)	Not used		
92	HP VOL	"Volume" adjustment value (IC206 ③)	80	80
93	BRIGHT	"Brightness" adjustment value (IC906 ⑤)	80	80
94	COLOR	"Color" adjustment value (IC906 ⑨)	80	80
95	HUE	"Hue" adjustment value (IC906 ⑫)	80	80
96 to FF		Not used		

Table 8-2 (3).

Note 2: The adjustment data initial value is the data input before performing video section adjustments (Page D) if the data of Page D has been erased due to some reason.

Note 3: The data written in the adjustment data memo column are fixed.
After adjusting, check that these data have not been rewritten by mistake.

8-2. ELECTRICAL SYSTEM ADJUSTMENTS

1. Oscillation frequency check (MA-137 board)

Mode	E-E
Measurement Point	Q001 collector
Measuring Instrument	Frequency counter
Specified Value	1000 ± 30 kHz

2. Power supply voltage check (MA-137 board)

Mode	E-E
Measuring Instrument	Digital voltmeter
SW 5V check	
Measurement Point	Pins ⑭ and ⑮ of W001
Specified Value	4.95 ± 0.2 Vdc
13V check	
Measurement Point	Pin ① of CN016
Specified Value	13.0 ± 0.5 Vdc
–8V check	
Measurement Point	Pin ④ of CN016
Specified Value	–8.0 ± 0.5 Vdc
–20V check	
Measurement Point	Pin ① of CN015
Specified Value	–20 ± 1 Vdc
DRUM VS check	
Measurement Point	Pin ⑬ of IC103
Specified Value	1.5 ± 0.3 Vdc (Note)
CAPSTAN VS check	
Measurement Point	Pin ㉙ of CN004
Specified Value	2.0 ± 0.3 Vdc (Note)

Note: The voltages of the drum and capstan servo will change according to tape and load conditions.

8-3. SYSTEM CONTROL SYSTEM ADJUSTMENT

1. EEPROM data input

If the data of page D has been erased due to some reason, input data to this page before adjusting. Refer to the "Page D address list" in "8-1-7. Service Mode" for the data of page D.

(1) Page D data input

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 95

Inputting method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address. (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote commander before changing the address.)

2. Battery end adjustment

Mode	Record (SP)
Signal	Arbitrary
Measurement Point	LCD display of adjusting remote commander
Measuring Instrument	
Adjustment Page	D
Adjustment Address	03 (BATT END DATA)

Connection:

1) Connect the regulated power supply and digital voltmeter as shown in Fig. 8-4.

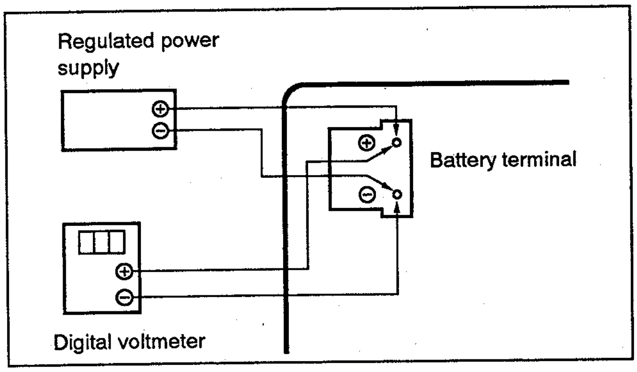


Fig. 8-4.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.5 ± 0.1 Vdc.
2) Set the record mode.
3) Release the protect.
   Page: 1, address: 00, data: 01
4) Set data: 01 to page: D, address: 01.
   (Setting test mode 1.)
5) Lower the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.50 ± 0.01 Vdc.
6) Select page: 3, address: 00, and set data: 02.
   (Specifying category 02.)
7) Select page: 3, address: 10, read the display data of the adjusting remote commander, and take it as D_{03}.
8) Set data: D_{03} to page: D, address: 03, and press the PAUSE button of the adjusting remote commander.
9) Convert D_{03} to a decimal numeral to obtain D_{03}'.
10) Calculate the adjustment data (decimal numeral) from the following equation (decimal calculation), convert it to a hexadecimal numeral, and input to each adjustment address.
    Address: 2D $D_{2D}'=D_{03}'+15$
    Address: 2E $D_{2E}'=D_{03}'+19$
    Address: 2F $D_{2F}'=D_{03}'+21$
    Note: Be sure to press the PAUSE button of the adjusting remote commander after setting each data.
11) Set data: 00 to page: D, address: 01.
    (Releasing test mode 1)
12) Perform "Battery down check".

3. Battery down check

Mode	Tuner record
Signal	Arbitrary

Connection:

1) Connect the regulated power supply and digital voltmeter as shown in Fig. 8-4.

Checking method:

Remove the adjusting remote commander, and check as follows. If unsatisfactory, re-adjust.

1) Adjust the output voltage of the regulated power supply so that the display of the digital voltmeter becomes 6.5 ± 0.1 Vdc.
2) Set the tuner recording mode.
3) Lower the output voltage of the regulated power supply so that the display of the digital voltmeter becomes 5.75 ± 0.01 Vdc.
4) Check that the power lamp is not blinking.
5) Lower the output voltage of the regulated power supply so that the display of the digital voltmeter becomes 5.55 ± 0.01 Vdc.
6) Check that the power lamp blinks every second.
7) Lower the output voltage of the regulated power supply so that the display of the digital voltmeter becomes 5.45 ± 0.01 Vdc.
8) Check that the power lamp blinks faster, the VTR stops, and the power supply turns off.

8-4. SERVO SYSTEM ADJUSTMENTS

1. Switching position adjustment (RP-144 board)

Mode	Playback
Signal	Alignment tape: For adjusting tracking (WR5-1NP)
Measurement Point	CH1: Pin ③ of CN053 (RF SWP) CH2: Pin ② of CN053 (V RF OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POS ADJ DATA LOW) 05 (SW POS ADJ DATA HIGH)
Specified Value	$t_1=0 \pm 5$ µsec.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 80 to page: D, address: 04.
3) Change the data of address: 05 (for rough adjustment) and address: 04 (for fine adjustment) of page: D, and adjust the switching position (t_1) to the specified value.
   Note: Be sure to press the PAUSE button of the adjusting remote commander before changing the address. If not, the new data will not be written in the memory.
4) Press the PAUSE button of the adjusting remote commander.

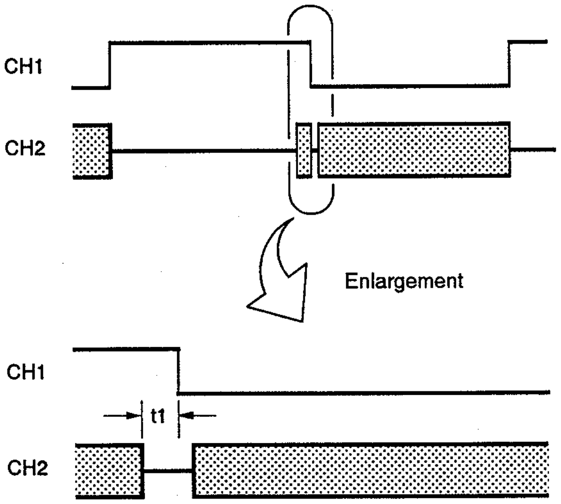


Fig. 8-5.

2. CAP FG duty adjustment (RP-144 board)

Mode	Record (SP)
Signal	Color bar
Measurement Point	Pin ④ of CN053 (CAP FG)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	8D (CAP FG DUTY)
Specified Value	Duty=50 ± 1%

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 80 to page: D, address: 8D.
3) Change the data of page: D, address: 8D, and adjust the CFG waveform duty to the specified value.
4) Press the PAUSE button of the adjusting remote commander.

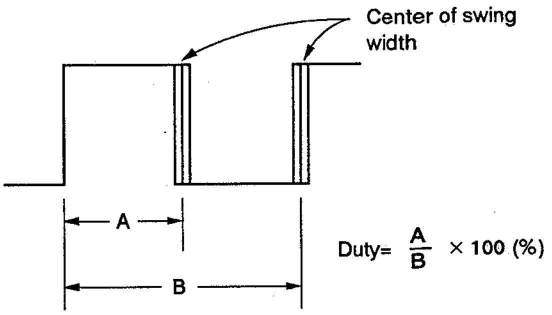


Fig. 8-6.

8-5. VIDEO ADJUSTMENTS

Basically, the video system must be adjusted according to the following adjustment procedures.

The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in the recording mode. Check that the sync signal and the color burst signal satisfy the specifications specified for the set-up for adjustments shown in Fig. 8-2.

[Adjusting Procedure]

1) Playback frequency characteristics adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) SYNC AGC adjustment
5) IR adjustment
6) Y/C separation adjustment
7) EMPH Y level adjustment
8) DE EMPH Y level adjustment
9) PB Y level adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis f0 adjustment
13) REC Y level adjustment
14) REC C level adjustment
15) REC ATF level check

1. Playback frequency characteristics adjustment (RP-144 board)

Note: [ ] contains the adjusting element of CH2.

Mode	Playback
Signal	Alignment tape: For adjusting frequency characteristics (WR5-7NE)
Measurement Point	CH1: Pin ② of CN053 (V RF OUT) External trigger: Pin ③ of CN053 (RF SWP)
Measuring Instrument	Oscilloscope TRIG. SLOW: +[–]
Adjustment Page	D
Adjustment Address	36 (M TUNE 1CH) [3E (M TUNE 2CH)]
Specified Value	4.5 MHz level: 7 MHz level= 40:(34 ± 2)

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 36 [address: 3E], and adjust the 4.5 MHz and 7 MHz level ratio of the PB RF output waveform to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

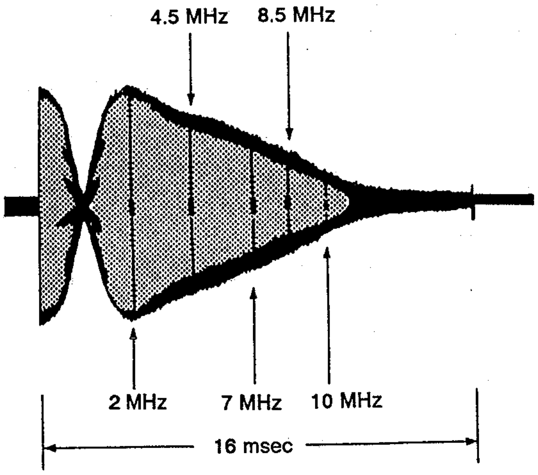


Fig. 8-7.

2. Flying erase check (RP-144 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ② of CN052 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Above 7.8 ± 0.7 MHz Voltage: Above 7.0 Vp-p

Note: Use a MP type tape.

Checking method:

1) Check that the oscillating frequency is 7.8 ± 0.7 MHz, and that the oscillating voltage is above 7.0 Vp-p.

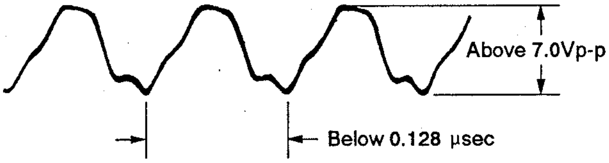


Fig. 8-8.

3. VXO oscillating frequency check (MA-137 board)

Mode	Playback
Signal	Color bar
Measurement Point	Q801 emitter
Measuring Instrument	Frequency counter
Specified Value	3579545 ± 150 Hz

Note: Connect the frequency counter via a high impedance (Approx. 10 MΩ) and low capacity buffer (below 10 pF).

Adjusting method:

1) Check that the fsc signal frequency is 3579545 ± 150 Hz.

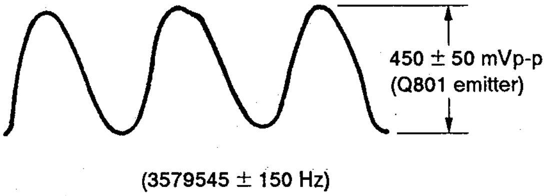


Fig. 8-9.

4. SYNC AGC level adjustment (MA-137 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑦ of IC707 (Pin ⑳ of CN007)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (SYNC AGC)
Specified Value	A=0.50 ± 0.02 V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4A, and adjust the Y signal level (A) to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

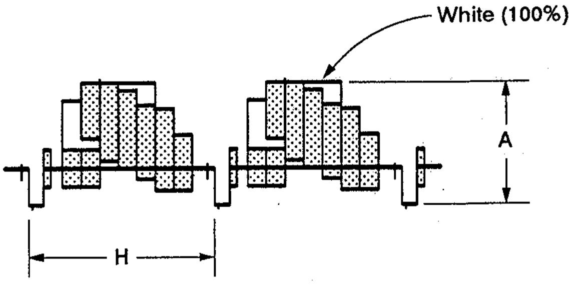


Fig. 8-10.

5. IR adjustment (MA-137 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑦ of IC701 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (IR)
Specified Value	Minimum residual chroma component (A) (Below 60 mVp-p)

Connection:

1) Connect Pin ⑭ of IC701 (or Pin ② of IC703) to Pin (51) of IC701 with a jumper wire.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4D, and minimize the residual chroma component (A).
3) Press the PAUSE button of the adjusting remote commander.

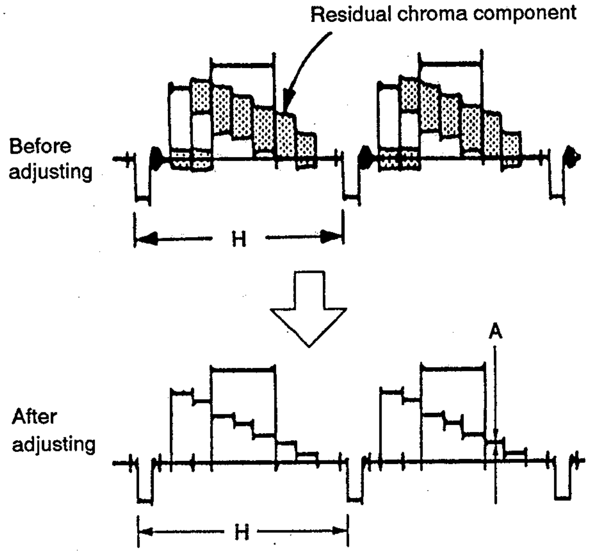

Residual chroma component
Before adjusting
H
A
After adjusting
H

Fig. 8-11.

6. Y/C separation adjustment (MA-137 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑪ of IC701 (C+CD)
Measuring Instrument	Oscilloscope
Adjusting Element	RV701 (phase)
Adjustment Page	D
Adjustment Address	4C (C COMB ADJUST)
Specified Value	Minimum residual chroma component (A)

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4C, and minimize the residual chroma component.
3) Minimize the residual chroma component (A) with RV701.
4) Repeat until the specifications in steps 2) and 3) are satisfied.
5) Press the PAUSE button of the adjusting remote commander.

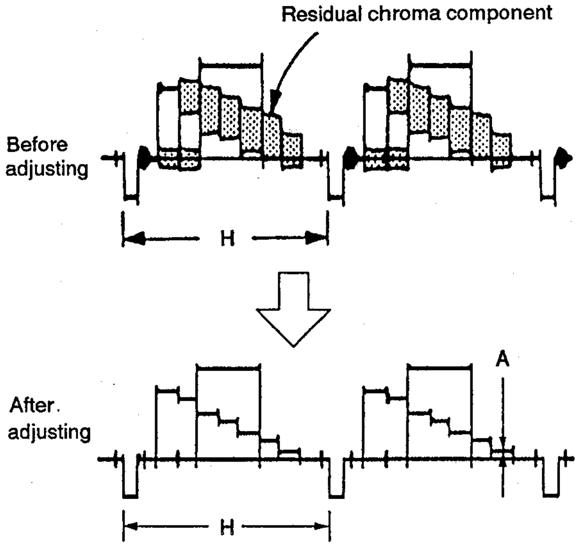

Residual chroma component
Before adjusting
H
A
After adjusting
H

Fig. 8-12.

7. EMPH Y level adjustment (MA-137 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑤ of IC702 (or Pin ③ of IC701)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPH Y)
Specified Value	A=0.50 ± 0.02V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5A, and adjust the Y signal level (A) to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

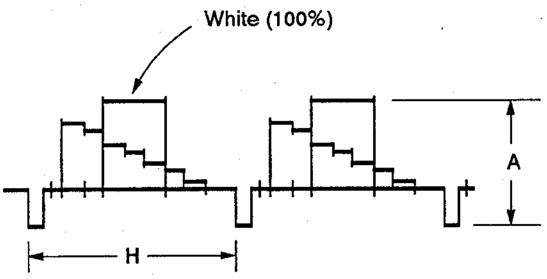


Fig. 8-13.

8. DE EMPH Y level adjustment (MA-137 board)

Mode	Playback
Signal	Alignment tape: For checking operations Color bar section • Normal mode WR5-5NSP • Hi8 mode WR5-8NSE
Measurement Point	Pin ㉑ of IC701
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	58 (DE EMPH)
Specified Value	A=0.50 ± 0.02V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Play back the color bar section of the normal mode alignment tape (WR5-5NSP).
3) Change the data of page: D, address: 58, and adjust the Y signal level (A) to the specified value.
4) Press the PAUSE button of the adjusting remote commander.
5) Play back the color bar section of the Hi8 mode alignment tape (WR5-8NSE).
6) Check that the Y signal level (A) is 0.50 ± 0.02V.

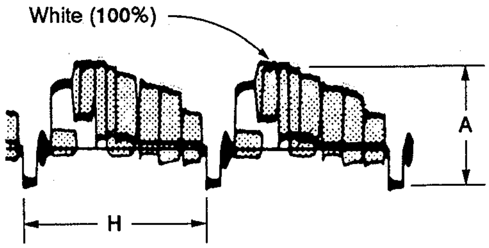


Fig. 8-14.

9. PB Y level adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video input/output terminal (Terminated at 75Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (PB Y)
Specified Value	A=1.0 ± 0.05V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5B, and adjust the video signal level (A) to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

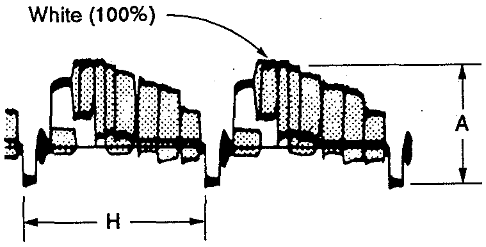


Fig. 8-15.

10. Y FM carrier frequency adjustment (MA-137 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ① of CN013 (REC Y)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (CAR)
Specified Value	4.38 ± 0.02 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4F, and adjust the Y FM carrier frequency to the specified value.
3) Press the PAUSE button of the adjusting remote commander.
4) Perform the "Deviation adjustment".

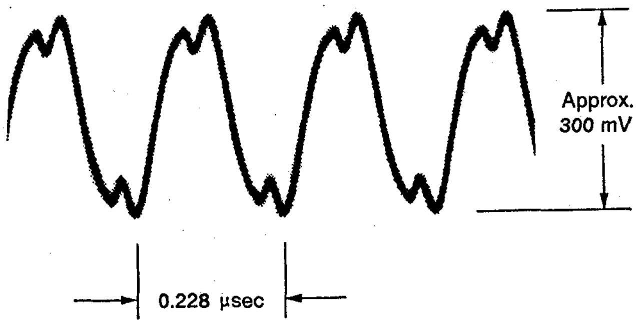


Fig. 8-16.

11. Y FM deviation adjustment (MA-137 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ㉑ of IC701
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (DEV)
Specified Value	A=0.50 ± 0.02V

Note: Check that the "DE EMPH Y level adjustment", and "Y FM carrier frequency adjustment" have been completed.

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Play back the recorded signal.
4) Check the playback signal level (A).
   Specification: A=0.50 ± 0.02V
5) If the specification has not been satisfied, change the data of page: D, address: 51, and repeat steps 2) to 4).

Playback signal level	Changing the data
When smaller than the specified value	Increase
When greater than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote commander.

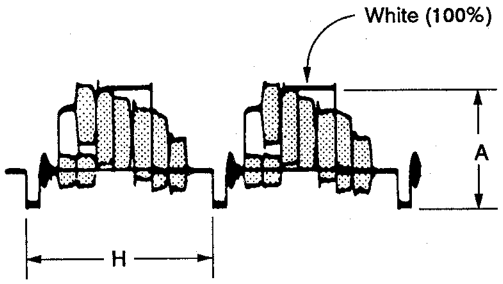


Fig. 8-17.

12. Chroma emphasis fo adjustment (MA-137 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ㉔ of IC801
Measuring Instrument	Oscilloscope
Adjustment Page	FL801
Adjustment Address	Minimum fo component

Connection:
1) Connect a 3.3 kΩ resistor (1-249-423-11) between Pin ㉔ of IC801 and the GND.

Adjusting method:
1) Minimize the amplitude of the latter section of the yellow part of the chroma signal with FL801.

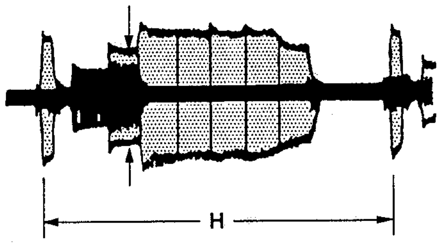

Minimize the amplitude of the latter section of the yellow part.

Fig. 8-18.

13. REC Y level adjustment (MA-137 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ① of CN013 (REC Y)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	54 (REC Y)
Specified Value	A=280 ± 10 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 54, and adjust the Y signal level (A) to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

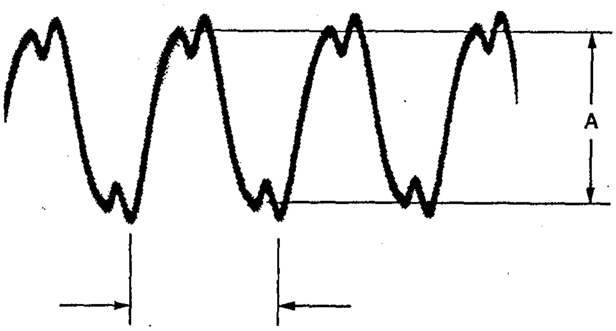


Fig. 8-19.

14. REC C level adjustment (MA-137 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ② of CN013 (REC C)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	30 (REC C RF)
Specified Value	A=140 ± 10 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 30, and adjust the amplitude (A) of the flat section of the chroma signal (red) to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

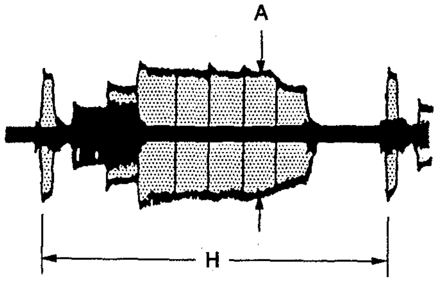


Fig. 8-20.

15. REC ATF level check (MA-137 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑯ of CN013 (REC ATF)
Measuring Instrument	Oscilloscope
Specified Value	A=600 ± 30 mVp-p

Checking method:

1) Check that the REC ATF signal level (A) satisfies the specified value.

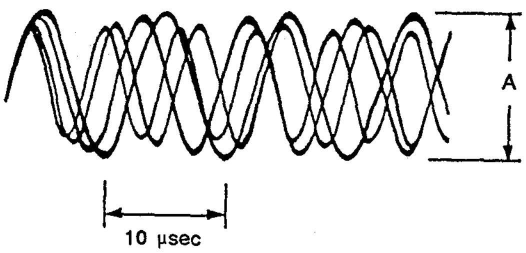


Fig. 8-21.

8-6. LCD SYSTEM ADJUSTMENTS

Note: Do not touch the LCD unit back light holder as you may receive an electric shock.

[Preparation]

1) Be sure to connect the LCD unit before adjusting.
2) Be sure to perform "EVR initial data input" before adjusting.

[Adjusting procedure]

1. fsc adjustment
2. EVR initial data input
3. G sub-bright adjustment
4. R sub-bright adjustment
5. B sub-bright adjustment
6. Contrast adjustment
7. R contrast adjustment
8. B contrast adjustment
9. Color adjustment
10. Hue adjustment
11. R sub-bias adjustment
12. B sub-bias adjustment
13. RGB bias adjustment
14. White balance adjustment
15. Character position adjustment

[Video input signal for adjustments]

Input a color bar signal whose chroma and burst signals are turned off into the video input terminal as the video input signal for adjustments. Check the signal level at the video input/output terminal.

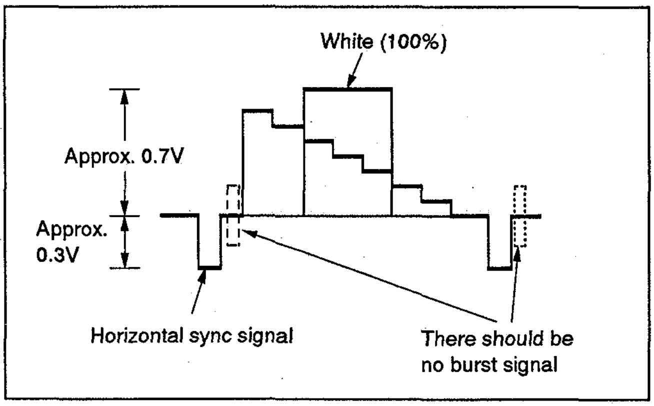


Fig. 8-22. Color bar signal whose chroma and burst signals are turned off.

1. fsc adjustment (RG-25 board)

Mode	POWER ON
Signal	No signal
Measurement Point	Pin ⑦ of IC901
Measuring Instrument	Frequency counter
Adjustment Page	RV902 (APC)
Adjustment Address	3579545 ± 50 Hz

Note: Connect the frequency counter with a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Adjusting method:

1) Adjust the fsc frequency to 3579545 ± 50 Hz with RV902.

2. EVR initial data input

Mode	POWER ON
Signal	Arbitrary
Adjustment Page	D

Adjusting method:

1) Release the protect.
Page: 1, address: 00, data: 01
2) Select page D, and input the data in the following table.
Note: To write in the nonvolatile memory (EEPROM), press the PAUSE button of the adjusting remote commander each time the data is set.

Address	Data
1B (BRIGHT)	80
1C (COLOR)	80
1D (HUE)	80
84 (R BRT)	A8
85 (G BRT)	A8
86 (B BRT)	A8
87 (B COM)	A8
88 (R COM)	A8
89 (COM)	A8
8A (GAIN)	A8
8B (R GAIN)	A8
8C (B GAIN)	A8
93 (BRIGHT)	80
94 (COLOR)	80
95 (HUE)	80

3. G sub-bright adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	Pin ⑪ of IC902 (VG)
Measuring Instrument	Oscilloscope External trigger: Pin ⑯ of IC902 (FRP)
Adjustment Page	D
Adjustment Address	85 (G BRT)
Specified Value	A=3.6 ± 0.1V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Check that the data of page: D, address: 1B is 80 with the adjusting remote commander.
3) Change the data of page: D, address: 85, and adjust the amplitude level (A) of the VG signal to the specified value.
   Amplitude: Level difference between the reverse waveform pedestal and non-reversed waveform pedestal.
4) Press the PAUSE button of the adjusting remote commander.

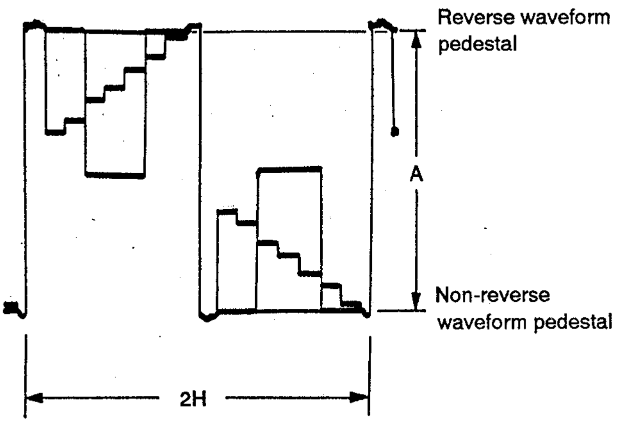


Fig. 8-23.

4. R sub-bright adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	CH1: Pin ⑪ of IC902 (VG) CH2: Pin ⑨ of IC902 (VR)
Measuring Instrument	Oscilloscope External trigger: Pin ⑯ of IC902 (FRP)
Adjustment Page	D
Adjustment Address	84 (R BRT)
Specified Value	Amplitude level difference between VR and VG signals=0 ± 0.1V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 84, and equalize the amplitude level of the CH1 waveform and the CH2 waveform.
3) Press the PAUSE button of the adjusting remote commander.

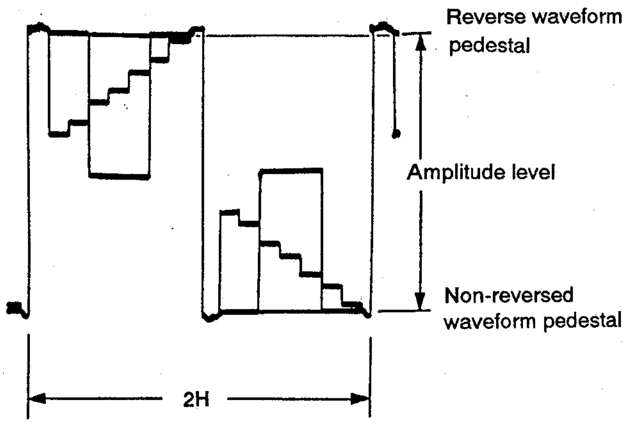


Fig. 8-24.

5. B sub-bright adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	CH1: Pin ⑪ of IC902 (VG) CH2: Pin ⑬ of IC902 (VB)
Measuring Instrument	Oscilloscope External trigger: Pin ⑯ of IC902 (FRP)
Adjustment Page	D
Adjustment Address	86 (B BRT)
Specified Value	Amplitude level difference between VB and VG signals=0 ± 0.1V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 86, and equalize the amplitude level of the CH1 waveform and the CH2 waveform.
3) Press the PAUSE button of the adjusting remote commander.

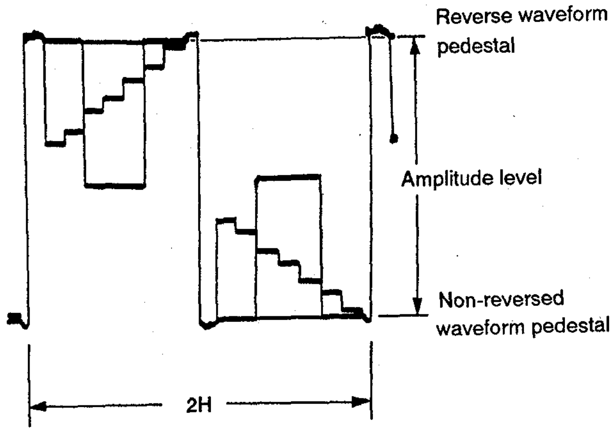


Fig. 8-25.

6. Contrast adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	Pin ⑪ of IC902 (VG)
Measuring Instrument	Oscilloscope External trigger: Pin ⑯ of IC902 (FRP)
Adjustment Page	D
Adjustment Address	8A (GAIN)
Specified Value	A=2.6 ± 0.1V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 8A and adjust the voltage (A) between the white (100%) and pedestal to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

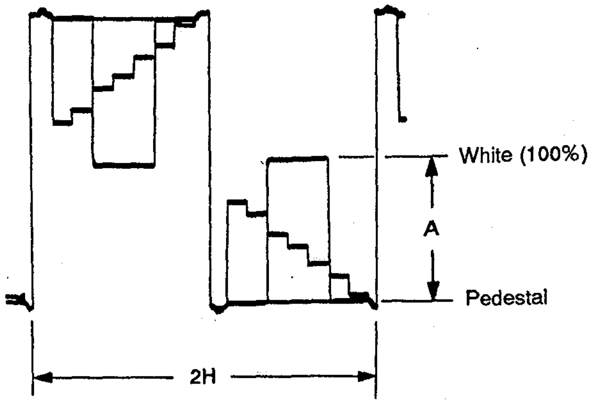


Fig. 8-26.

7. R contrast adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	Pin ⑨ of IC902 (VR)
Measuring Instrument	Oscilloscope External trigger: Pin ⑯ of IC902 (FRP)
Adjustment Page	D
Adjustment Address	8B (R GAIN)
Specified Value	A=2.6 ± 0.1V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 8B, and adjust the voltage (A) between the white (100%) and pedestal to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

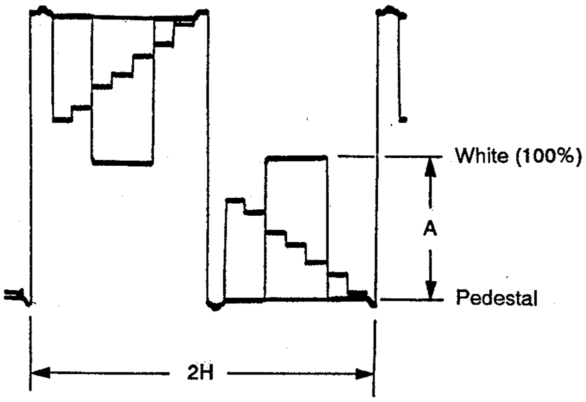


Fig. 8-27.

8. B contrast (RG-25 board)

Mode	POWER ON
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	Pin ⑬ of IC902 (VB)
Measuring Instrument	Oscilloscope External trigger: Pin ⑯ of IC902 (FRP)
Adjustment Page	D
Adjustment Address	8C (B GAIN)
Specified Value	A=2.6 ± 0.1V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 8C, and adjust the voltage (A) between the white (100%) and pedestal to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

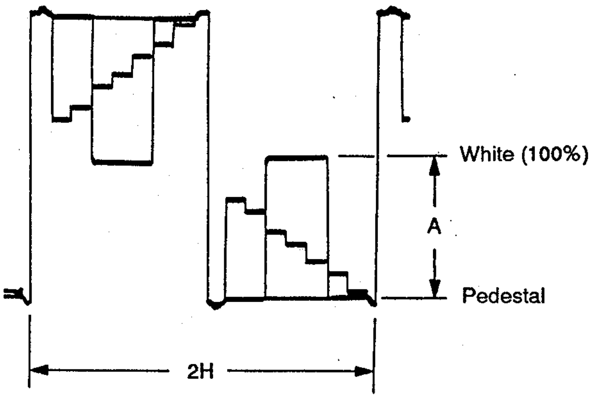


Fig. 8-28.

9. Color adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar (Chroma and burst signals ON)
Measurement Point	Pin ⑪ of IC902 (VG)
Measuring Instrument	Oscilloscope External trigger: Pin ⑯ of IC902 (FRP)
Adjusting Element	RV903
Specified Value	A=0 ± 0.1V

Adjusting method:

1) Check that the data of page: D, address 1C is 80 with the adjusting remote commander.
2) Minimize the level difference (A) of the white 75% and green with RV903.

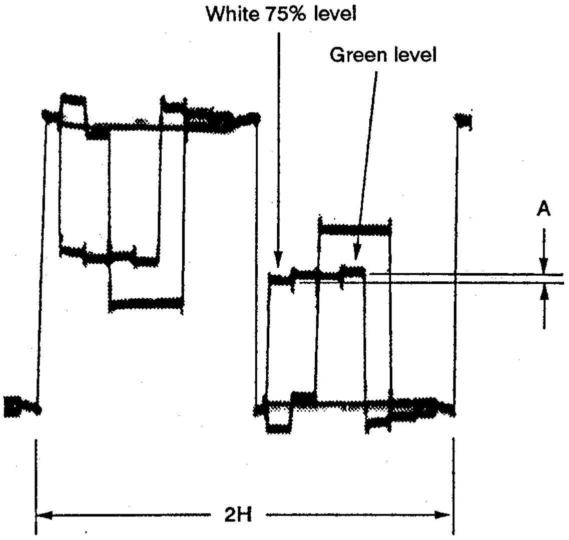


Fig. 8-29.

10. Hue adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar (Chroma and burst signals ON)
Measurement Point	CH1: Pin ⑪ if IC902 (VG) CH2: Pin ⑨ of IC902 (VR)
Measuring Instrument	Oscilloscope External trigger: Pin ⑯ of ICN902 (FRP)
Adjusting Element	RV901 (HUE)
Specified Value	B=A ± 0.1V

Adjusting method:

1) Check that the data of page: D, address: 1D is 80 with the adjusting remote commander.
2) Equalize the yellow level of the VG signal (A) and that of the VR signal (B) with RV901.
   Yellow level: Level difference between yellow and pedestal

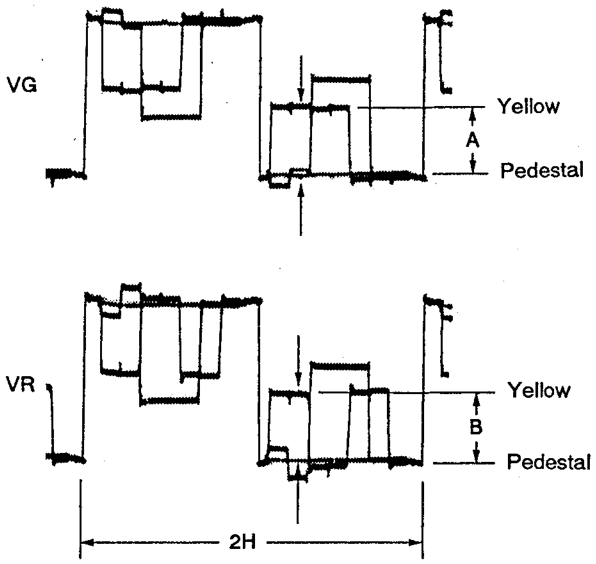


Fig. 8-30.

11. R sub-bias adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	CH1: Pin ⑪ of IC902 (VG) CH2: Pin ⑨ of IC902 (VR)
Measuring Instrument	Oscilloscope (DC range) External trigger: Pin ⑯ of IC902 (FRP)
Adjustment Page	D
Adjustment Address	88 (R COM)
Specified Value	DC level difference between the VR and VG signals=0 ± 0.1V

Adjusting method:

1) Check that the data of page: D, address: 89 is A8 with the adjusting remote commander.
2) Set the oscilloscope to the DC range, and equalize the GND levels of CH1 and CH2.
3) Release the protect.
   Page: 1, address: 00, data: 01
4) Change the data of page: D, address: 88, and coincide the CH1 and CH2 waveform. (To equalize the DC levels of the CH1 and CH2 waveform.)
5) Press the PAUSE button of the adjusting remote commander.

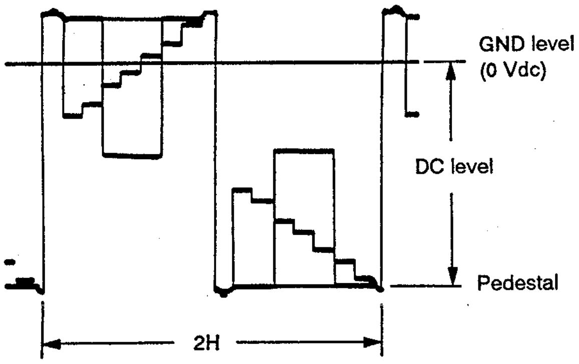


Fig. 8-31.

12. B sub-bias adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	CH1: Pin ⑪ of IC902 (VG) CH2: Pin ⑬ of IC902 (VB)
Measuring Instrument	Oscilloscope (DC range) External trigger: Pin ⑯ of IC902 (FRP)
Adjustment Page	D
Adjustment Address	87 (B COM)
Specified Value	DC level difference between the VB and VG signals=0 ± 0.1V

Adjusting method:

1) Set the oscilloscope to the DC range, and equalize the GND levels of CH1 and CH2.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Change the data of page: D, address: 87, and coincide the CH1 and CH2 waveform. (To equalize the DC levels of the CH1 and CH2 waveform.)
4) Press the PAUSE button of the adjusting remote commander.

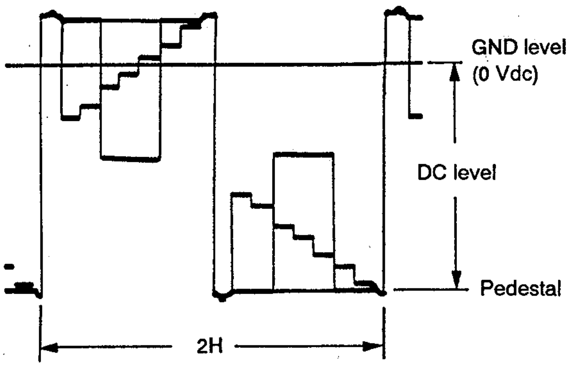


Fig. 8-32.

13. RGB bias adjustment

Mode	PB and PAUSE (LP)
Signal	Alignment tape: For checking operations (WR5-4NL) Monoscope section
Measurement Point	Check on the LCD display
Measuring Instrument	
Adjustment Page	D
Adjustment Address	89 (COM)
Specified Value	Minimum flicker

Adjusting method:

1) Play back the monoscope section of the LP alignment tape, and press the PAUSE button.
2) Release the protect with the adjusting remote commander.
   Page: 1, address: 00, data: 01
3) Change the data of page: D, address: 89, and minimize the flicker of the LCD display.
4) Press the PAUSE button of the adjusting remote commander.

14. White balance adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar signal whose chroma and burst signals are turned off
Measurement Point	Check on the LCD display
Measuring Instrument	
Adjustment Page	D
Adjustment Address	84 (R BRT), 86 (B BRT)
Specified Value	The display should not be colored

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Check that the LCD display is not colored. If it is, change the data of address: 84 and address: 86 of page: D, and adjustment the display is not colored.
3) Press the PAUSE button of the adjusting remote commander.

15. Character position adjustment (RG-25 board)

Mode	POWER ON
Signal	Color bar
Measurement Point	Check on the LCD display
Measuring Instrument	
Adjusting Element	CV901
Specified Value	A=B

Adjusting method:

1) Press the MENU button, and set the menu display.
2) Select "SOUND".
3) Adjust A=B with CV901.

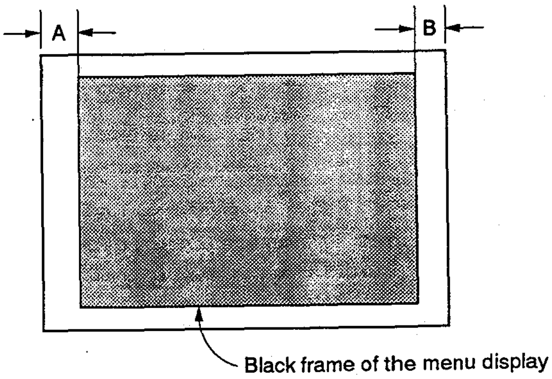


Fig. 8-33.

8-7. AUDIO SYSTEM ADJUSTMENTS

- Adjust using the color bar signal as the video signal input.

- Set the following modes at the menu display.
  SOUND························ NORMAL
  REC MODE ·················· SP
  ST MONITOR (Note 1)···· STEREO
  Note 1: Displayed on the menu display when the AFM stereo tape is played back.

[Connecting the measuring equipments for audio]

In addition to the measuring equipments for the video system, connect the measuring equipments for the audio system as shown in Fig. 8-34, and adjust with the power supply switch at "VTR ON" mode.

Note: 1) When inputting the audio signal, input the same signal to both the L and R channels, unless specified otherwise.

2) Be sure to insert the plug (shorting plug or dummy plug, etc.,) into the audio input/output terminal (right). If the plug is not inserted, the monaural mode will be set, and correct adjustments cannot be carried out.
(Monaural mode)
During recording ··· The REC AFM RF 1.7 MHz carrier will not be output.
During playback ···· The L+R signal will be output from the audio input/output terminal (left).

3) Adjustments for channel R in adjustments for both channels L and R are indicated in the [ ].

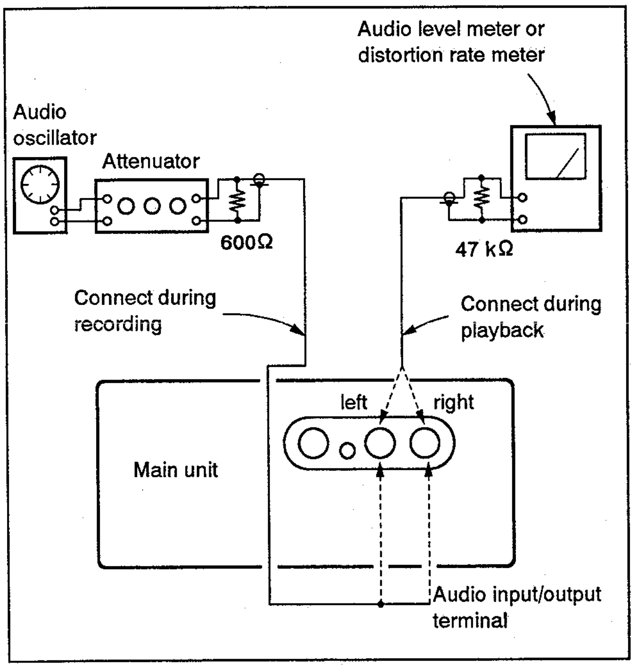

Audio level meter or distortion rate meter
Audio oscillator
Attenuator
600Ω
47 kΩ
Connect during recording
Connect during playback
left
right
Main unit
Audio input/output terminal

Fig. 8-34.

[Adjusting Procedure]

1) E-E output level check
2) REC matrix L–R check
3) REC matrix L+R check
4) 1.5 MHz carrier frequency adjustment
5) 1.7 MHz carrier frequency adjustment
6) 1.5 MHz record level check
7) 1.7 MHz record level check
8) 1.5 MHz playback level adjustment
9) 1.7 MHz playback level adjustment
10) 1.5 MHz deviation adjustment
11) 1.7 MHz deviation adjustment
12) Overall level characteristics, distortion rate check
13) Separation check
14) Overall noise level check

1. E-E output level check (AU-136 board)

Mode	Record
Signal	400 Hz, –7.5 dBs audio input terminal (right [left])
Measurement Point	Pin ⑪ of IC404 [Pin ⑪ of IC406]
Measuring Instrument	Oscilloscope or audio level meter
Specified Value	925^{+240}_{-190} mVp-p (–7.5 ± 2 dBs)

Checking method:
1) Check that the 400 Hz signal level satisfies the specification.

2. REC matrix L–R check (AU-136 board)

Mode	E-E
Signal	400 Hz, –7.5 dBS Input to both left and right audio input terminals
Measurement Point	Pin ⑦ of IC403
Measuring Instrument	Oscilloscope (Use 1: 1 probe)
Specified Value	0 ± 2 mVp-p

Checking method:
1) Input a 400 Hz, –7.5 dBs signal only to the right audio input terminal.
2) Check that the signal level of Pin ⑦ of IC403 is approximately 120 mVp-p.
3) Input a 400 Hz, –7.5 dBS signal to both the right and left audio input terminals.
4) Check that the signal level of Pin ⑦ of IC403 is 0 ± 2 mVp-p. (Note: Remove the video signal input)

3. REC matrix L+R check (AU-136 board)

Mode	Record
Signal	1. 400 Hz, –7.5 dBs: Audio input terminal (left) No signal: Audio input terminal (right) 2. No signal: Audio input terminal (left) 400 Hz, –7.5 dBs: Audio input terminal (right)
Measurement Point	Pin ① of IC403
Measuring Instrument	Oscilloscope
Specified Value	Level difference should be 0 ± 5 mVp-p when input only to the left terminal, and when input only to the right terminal.

Adjusting method:
1) Input the 400 Hz, –7.5 dBs signal only to the left audio input terminal. (Insert the shorting plug in the right audio input terminal.)
2) Read the 400 Hz signal level of Pin ① of IC403, and note it down. (Approx. 120 mVp-p)
3) Input the 400 Hz, –7.5 dBs signal only to the right audio input terminal. (Insert the shorting plug in the left audio input terminal.)
4) Check that the 400 Hz signal level of Pin ① of IC403 (value noted at step 2) is ± 5 mVp-p.

4. 1.5 MHz carrier frequency adjustment (AU-136 board)

Mode	Record
Signal	No signal
Measurement Point	Pin (79) of IC401 (1.5M CAR OUT)
Measuring Instrument	Frequency counter (Note)
Adjustment Page	D
Adjustment Address	7A (1.5 IR)
Specified Value	1.500 ± 0.003 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7A, and adjust the carrier frequency to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

5. 1.7 MHz carrier frequency adjustment (AU-136 board)

Mode	Record
Signal	No signal
Measurement Point	Pin (62) of IC401 (1.7M CAR OUT)
Measuring Instrument	Frequency counter (Note)
Adjustment Page	D
Adjustment Address	7C (1.7 IR)
Specified Value	1.700 ± 0.003 MHz

Note: Use a high impedance (above 1 MΩ), and low capacity (below 20 pF) probe.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7C, and adjust the carrier frequency to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

6. 1.5 MHz carrier level check (AU-136 board)

Mode	Record
Signal	No signal
Measurement Point	Pin (79) of IC401 (1.5M CAR OUT)
Measuring Instrument	Oscilloscope
Specified Value	A=450 ± 50 mVp-p

Checking method:

1) Check that the 1.5 MHz carrier level satisfies the specified value.

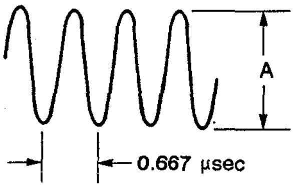


Fig. 8-35.

7. 1.7 MHz carrier level check (AU-136 board)

Mode	Record
Signal	No signal
Measurement Point	Pin (62) of IC401 (1.7M CAR OUT)
Measuring Instrument	Oscilloscope
Specified Value	420 ± 50 mVp-p

Checking method:

1) Check that the 1.7 MHz carrier level satisfies the specified value.

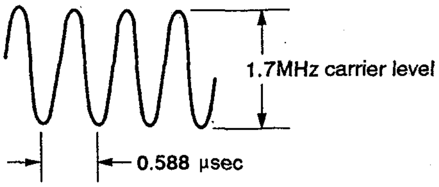


Fig. 8-36.

8. 1.5 MHz playback level adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP)
Measurement Point	Left or right audio output terminal
Measuring Instrument	Audio level meter
Adjustment Page	D
Adjustment Address	78 (1.5 DEV PB)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 78, and adjust the 400 Hz signal level to the specified value.
3) Press the PAUSE button of the adjusting remote commander.

9. 1.7 MHz playback level adjustment

Mode	Playback
Signal	Alignment tape: For checking AFM stereo operations (WR5-9NS) Stereo (color bar) section
Measurement Point	Audio output terminal (right)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	79 (1.7 DEV PB)
Specified Value	Minimum 400 Hz crosstalk component

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 79, and minimize the 400 Hz crosstalk component.
3) Press the PAUSE button of the adjusting remote commander.

10. 1.5 MHz deviation adjustment

Mode	Record and playback
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio input/output terminal (left)
Measuring Instrument	Audio level meter
Adjustment Page	D
Adjustment Address	7B (1.5 DEV REC)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Input the 400 Hz, –7.5 dBs signal only to the left audio input terminal.
   (Insert a shorting plug in the right audio input terminal.)
3) Record the signal.
4) Remove the input signal.
5) Play back the recorded section.
6) Check that the playback signal level satisfies the specified value.
7) If not, change the data of page: D, address: 7B and repeat steps 2) to 6).

Playback signal level	Changing the data
When smaller than the specified value	Increase
When greater than the specified value	Decrease

9) Press the PAUSE button of the adjusting remote commander.

11. 1.7 MHz deviation adjustment

Mode	Record and playback
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio input/output terminal (right)
Measuring Instrument	Audio level meter
Adjustment Page	D
Adjustment Address	7D (1.7 DEV REC)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Input the 400 Hz, –7.5 dBs signal only to the right audio input terminal.
   (Insert a shorting plug in the left audio input terminal.)
3) Record the signal.
4) Remove the input signal.
5) Play back the recorded section.
6) Check that the playback signal level satisfies the specified value.
7) If not, change the data of page: D, address: 7D and repeat steps 2) to 6).

Playback signal level	Changing the data
When smaller than the specified value	Increase
When greater than the specified value	Decrease

9) Press the PAUSE button of the adjusting remote commander.

12. Overall level characteristics distortion rate check

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal (left [right]) No signal: Audio input terminal (right [left])
Measurement Point	Audio output terminal (left [right])
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –7.5 ± 2 dBs Distortion rate: Below 1.2% (Note 2)

Note: 1) [ ] contains points to be measured when checking the right channel.

2) Value when the following filter is used

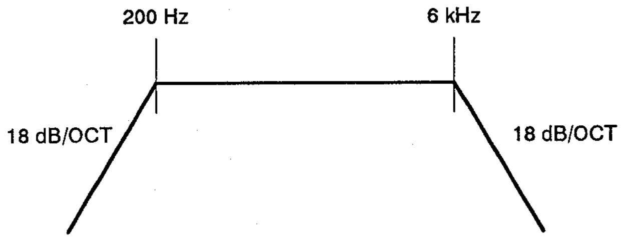


Fig. 8-37.

Checking method:

1) Input the 400 Hz, –7.5 dBs signal only to the left audio input terminal [right].
   Note: Be sure to insert the shorting plug in the terminal without any signal input.
2) Record the signal.
3) Remove the input signal.
4) Play back the recorded section.
5) Check that the 400 Hz signal level of the left audio output terminal [right] is –7.5 ± 2 dBs, and distortion rate is below 1.2% (Note 2).

13. Separation check

Mode	Self recording/playback
Signal	No signal: Audio input terminal (left [right]) 1 kHz, –7.5 dBs: Audio input terminal (right [left])
Measurement Point	Audio output terminal (left [right])
Measuring Instrument	Audio level meter (Use the IHF-A curve auditory correction filter)
Specified Value	Below –27.5 dBs

Note: [ ] contains points to be measured when checking the right channel.

Checking method:

1) Insert the shorting plug into the left audio input terminal [right], and input the 1 kHz, –7.5 dBs signal only to the right audio input terminal [left].
2) Record the signal.
3) Remove the input signal.
4) Play back the recorded section.
5) Check that the crosstalk (1 kHz) level of the left audio output terminal [right] is below –27.5 dBs.

14. Overall noise level check

Mode	Self-recording
Signal	No signal: Audio input terminal (left and right)
Measurement Point	Audio output terminal (left [right])
Measuring Instrument	Audio level meter (Use the IHF-A curve auditory correction filter)
Specified Value	Below –63.0 dBs

Note: [ ] contains points to be measured when checking the right channel.

Checking method:

1) Insert the shorting plug in both the left and right audio input terminals.
2) Record.
3) Remove the shorting plug.
4) Play back the recorded section.
5) Check that the noise level of the left audio output terminal [right] is below –63.0 dBs.

8-8. TGV-3 ELECTRICAL ADJUSTMENTS

Use the following measuring equipments in electrical adjustments.

〔Equipments Used〕

1) TV Monitor
2) Oscilloscope 2 phenomena, band 30 MHz or wider, with delay mode (Use 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator
5) Digital voltmeter
6) Voice multiplexed signal generator
7) Regulated power supply
8) Video cassette recorder (GV-S50)

〔Connecting the Equipments〕

Connect the video cassette recorder (GV-S50) and adjust, unless specified otherwise.

Position of Tuner Timer Unit (TGV-3) Switch

- Input/output selection switch ························· TV position

1. Clock adjustment (TM-118 board)

Measurement Point	Pin ⑧ of IC400
Measuring Instrument	Frequency counter
Adjusting Element	CV400
Specified Value	4096.010 ± 0.015 Hz

Adjusting method:

1) Adjust the clock frequency to the specified value with CV400.

2. RF AGC adjustment (TU-142 board)

Measurement Point	TV broadcasting signal
Measuring Instrument	Connect the TV monitor and check
Adjusting Element	
Specified Value	Refer to Fig. 8-38.

Adjusting method:

1) Adjust the contrast of the TV monitor to maximum.
2) Rotate the RV for adjusting RF AGC until the snow noise appears.
3) Rotate it in the opposite direction until the snow noise disappears.
4) Receive each channel and check that there is no beat or image distortion by cross modulations, nor snow noise.

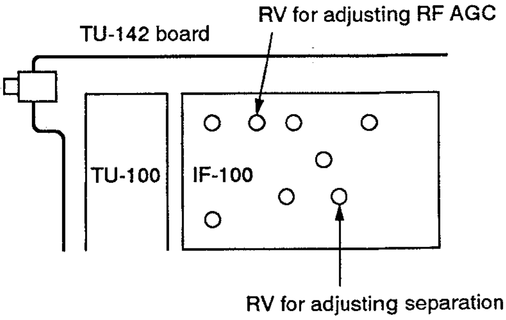


Fig. 8-38.

3. Separation adjustment (TU-142 board)

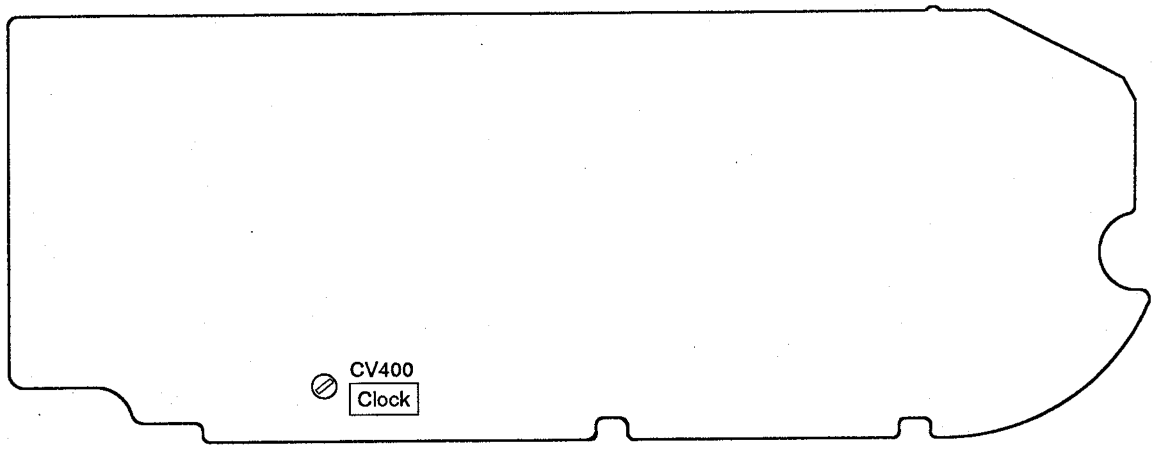
Signal	Voice multiplexed RF signal (VIDEO : Color bar AUDIO L : 400 Hz AUDIO R : 1 kHz)
Measurement Point	Lch: Pin ㉑ of CN100 Rch: Pin ㉒ of CN100
Measuring Instrument	Oscilloscope
Specified Value	Refer to Fig. 8-38.

Adjusting method:

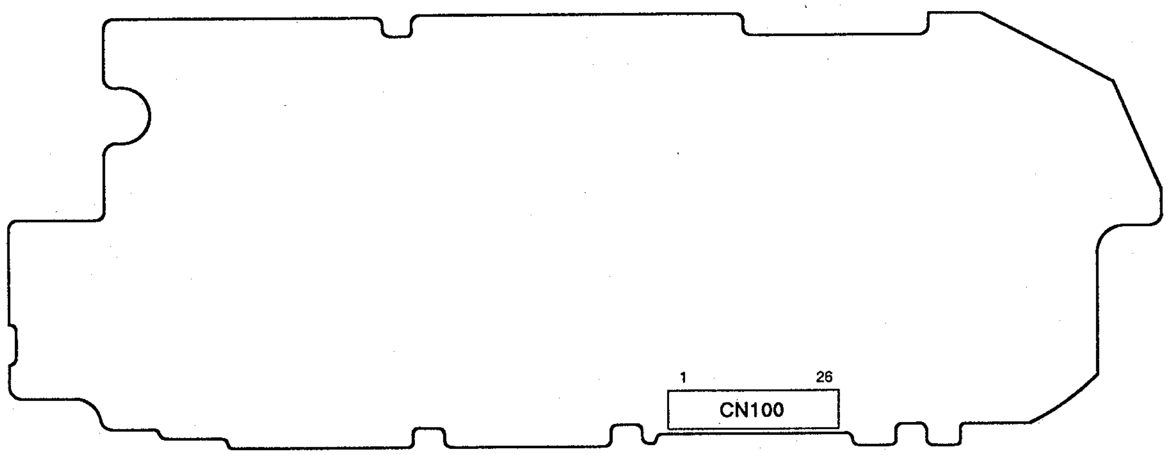
1) Adjust the RV for adjusting separation so that the crosstalk component (1 kHz) for Lch and that (400 Hz) for Rch become minimum.

8-9. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

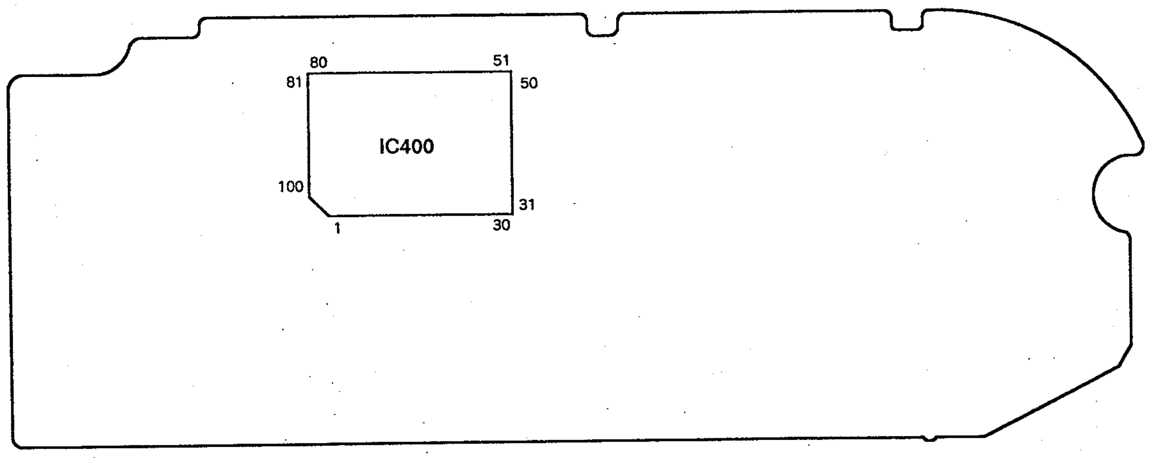
TM-118 BOARD (COMPONENT SIDE)


CV400
Clock

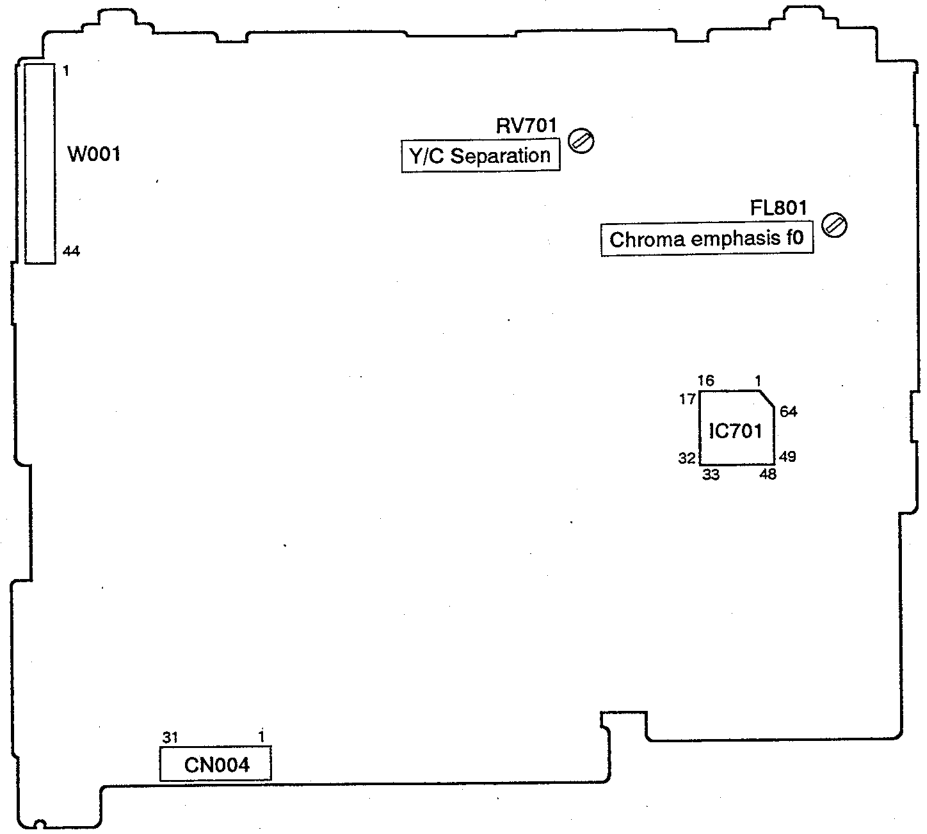
TM-118 BOARD (CONDUCTOR SIDE)



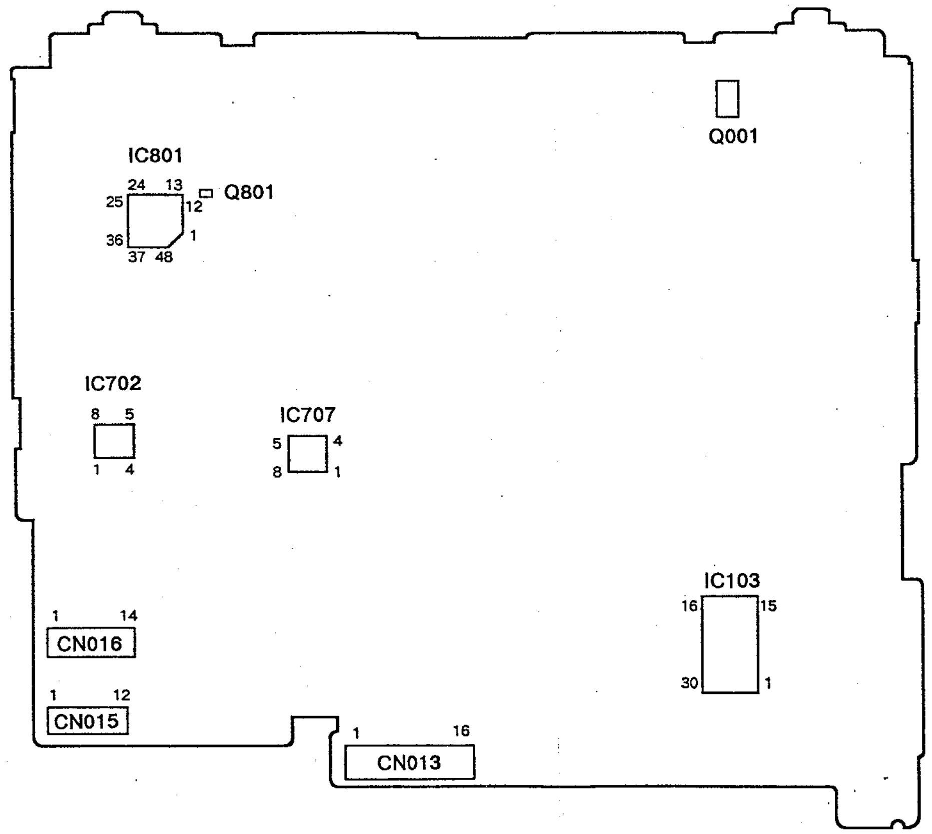
TU-142 BOARD (CONDUCTOR SIDE)


80
51
81
50
IC400
100
31
1
30

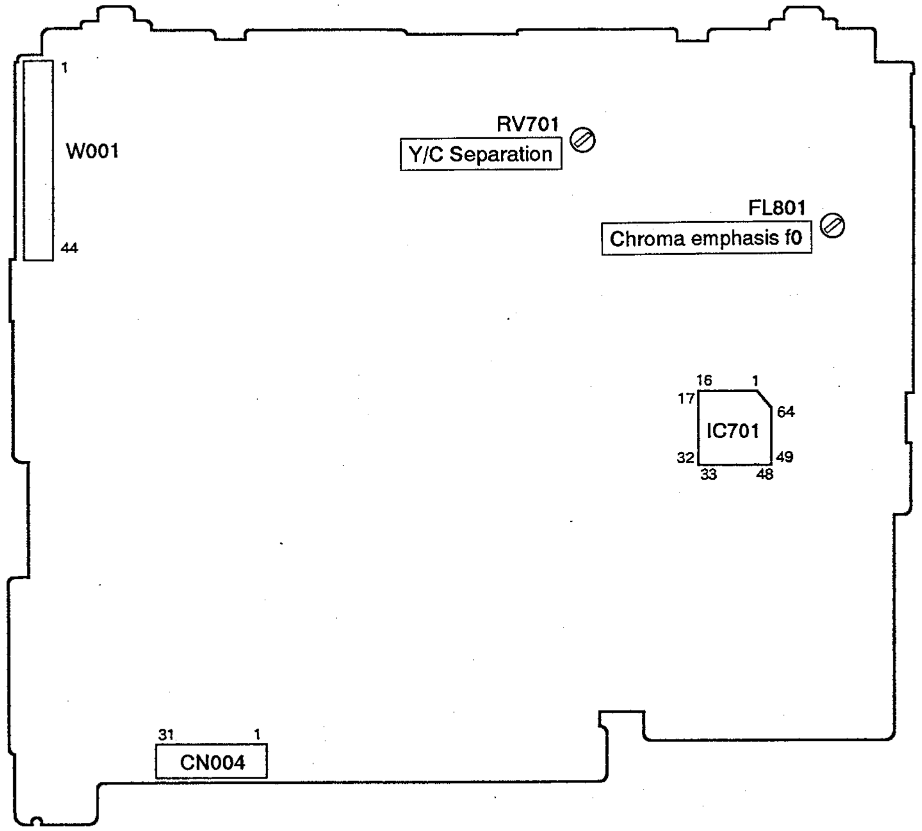
MA-137 BOARD (COMPONENT SIDE)


1
W001
44
RV701
Y/C Separation
FL801
Chroma emphasis f0
16
1
17
64
IC701
32
49
33
48
31
1
CN004

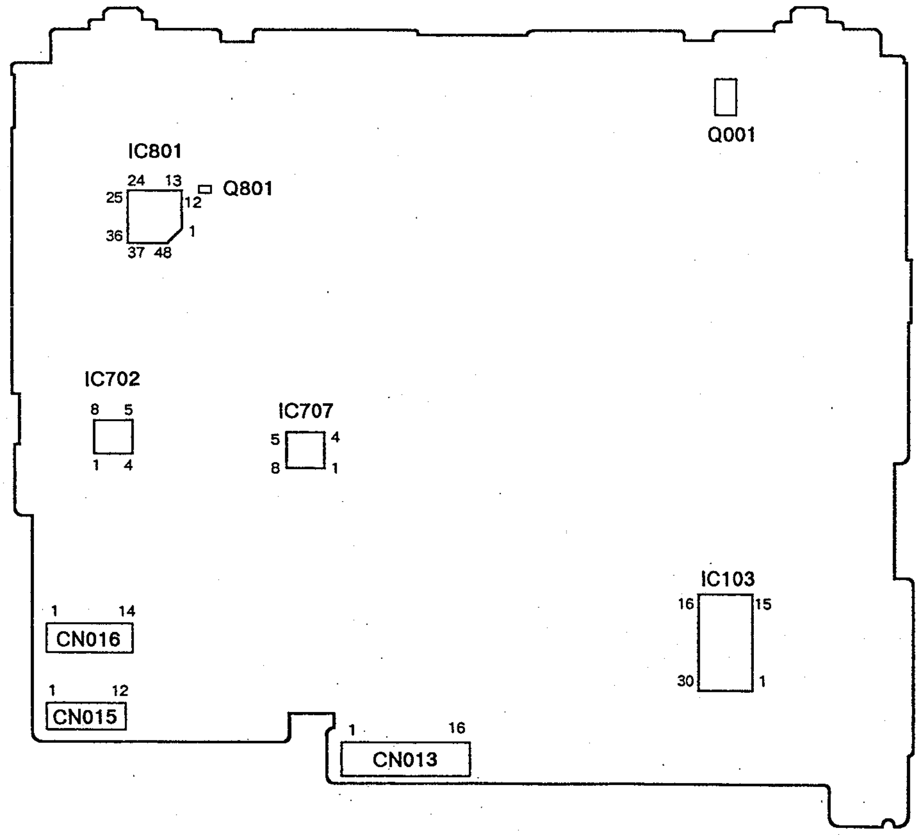
MA-137 BOARD (CONDUCTOR SIDE)


Q001
IC801
24
13
25
12
Q801
36
1
37
48
IC702
8
5
1
4
IC707
5
4
8
1
IC103
16
15
30
1
1
14
CN016
1
12
CN015
1
16
CN013

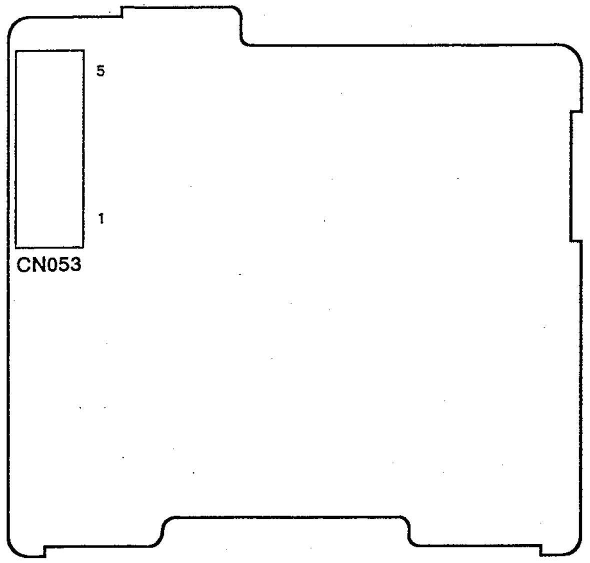
MA-137 BOARD (COMPONENT SIDE)


W001
1
44
RV701
Y/C Separation
FL801
Chroma emphasis f0
IC701
16
1
17
64
32
49
33
48
CN004
31
1

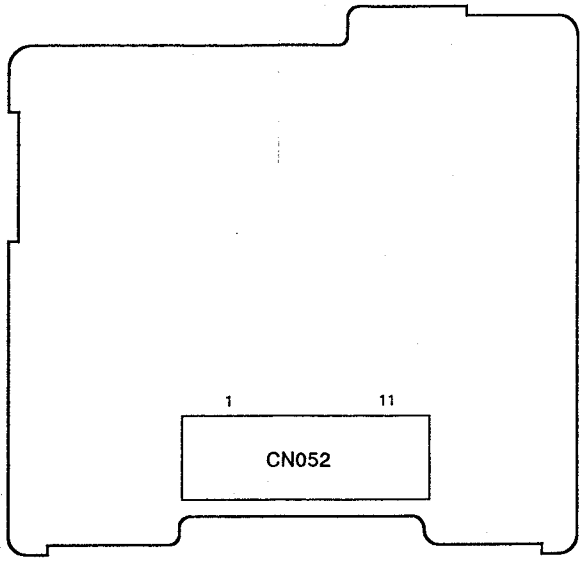
MA-137 BOARD (CONDUCTOR SIDE)


Q001
IC801
24
13
25
12
36
1
37
48
Q801
IC702
8
5
1
4
IC707
5
4
8
1
IC103
16
15
30
1
CN016
1
14
CN015
1
12
CN013
1
16

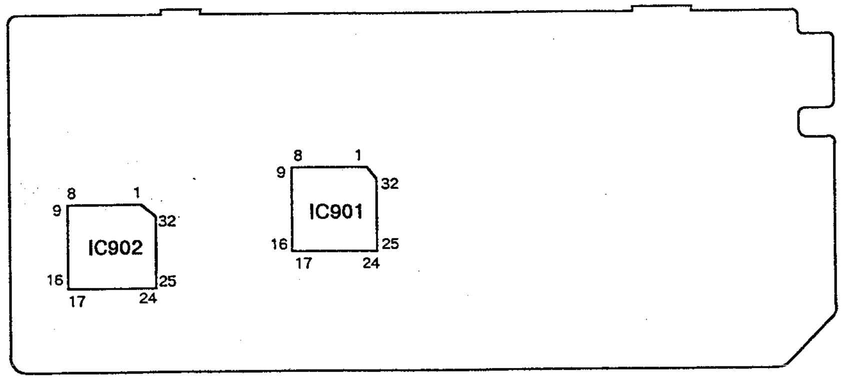
RP-144 BOARD (COMPONENT SIDE)



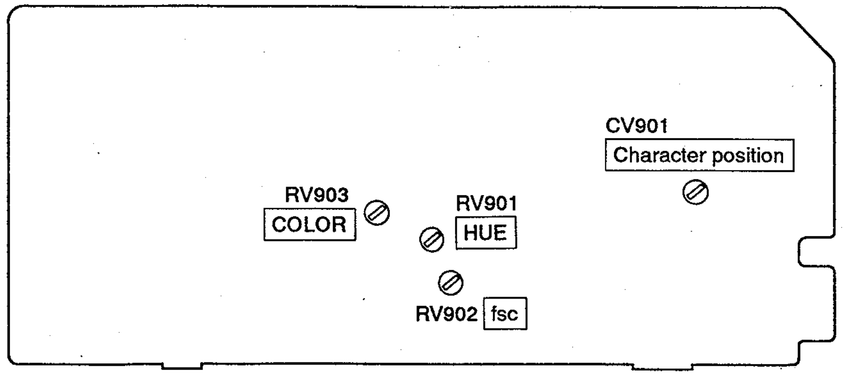
RP-144 BOARD (CONDUCTOR SIDE)



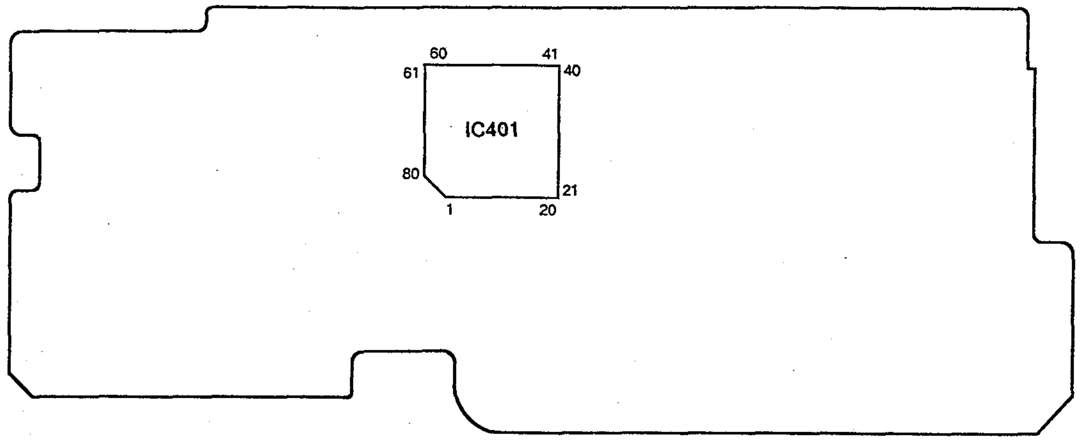
RG-25 BOARD (CONDUCTOR SIDE)


IC902
8
1
9
32
16
25
17
24
IC901
8
1
9
32
16
25
17
24

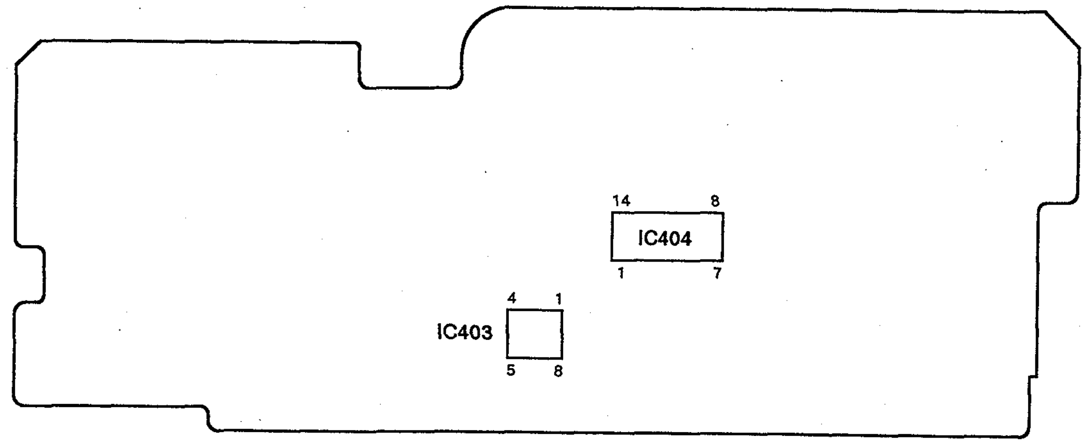
RG-25 BOARD (COMPONENT SIDE)


CV901
Character position
RV903
COLOR
RV901
HUE
RV902
fsc

AU-136 BOARD (CONDUCTOR SIDE)


60
41
61
40
IC401
80
21
1
20

AU-136 BOARD (COMPONENT SIDE)

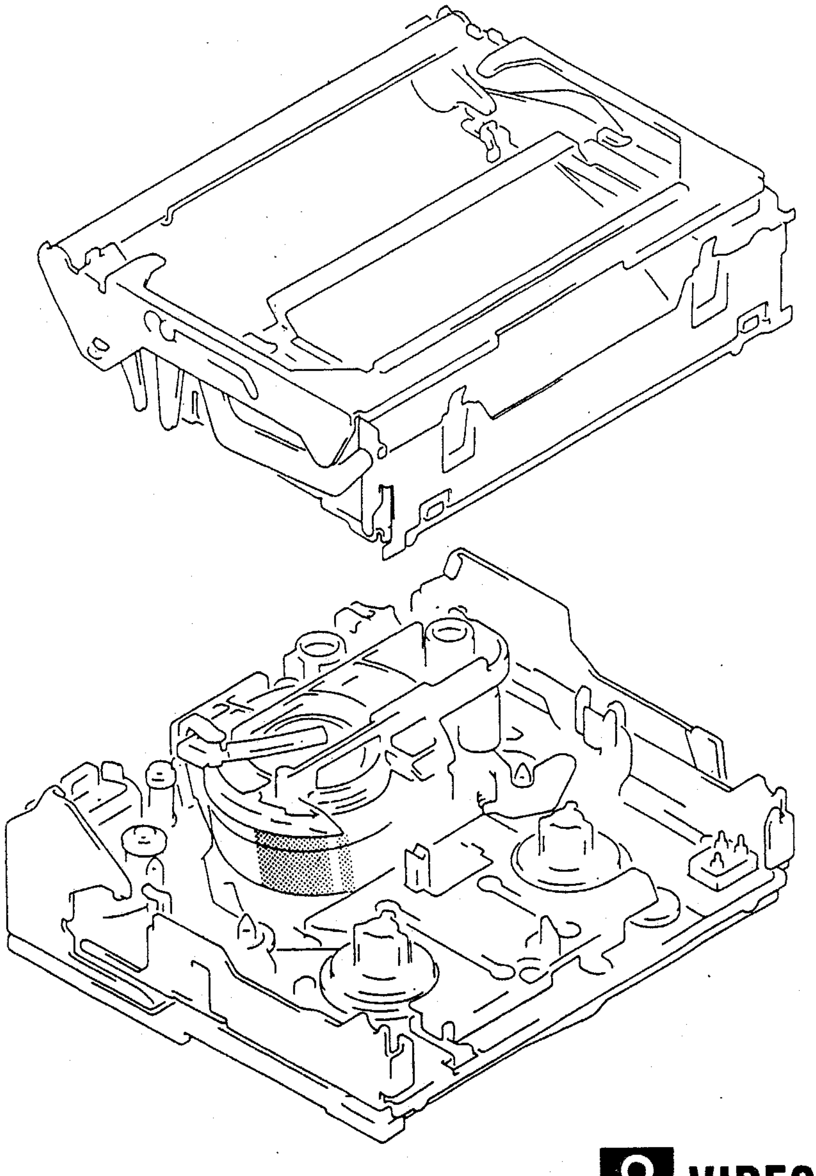

14
8
IC404
1
7
4
1
IC403
5
8

8 mm Video MECHANICAL ADJUSTMENT MANUAL IV

A MECHANISM

Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-3, Handling of Mode Selector".)

1-1. CASSETTE COMPARTMENT ASSEMBLY

1. Removal (Fig. 1)

1) Select the USE mode.
2) Push the part ⓐ of lock arm ❶ toward the arrow 🅐 to unlock from lock guide ❷, and raise the cassette compartment as shown in Fig. a.
3) Remove two screws ❸ and remove the LS frame ❹ toward the arrow 🅑.
4) With the cassette compartment assembly ❺ pushed in arrow 🅒 direction, distort tabs ⓑ and ⓒ of MD side plate toward the arrow 🅓 to disengage from catches ⓓ and ⓔ of cassette compartment assembly respectively.
   In such a case, insert a screwdriver between MD side plate and catch and disengage the tab ⓑ first, then disengage the tab ⓒ for easy removal as shown in Fig. b.
5) Raise the cassette compartment assembly ❺ in the opposite direction of arrow 🅒 until the shafts ⓕ and ⓖ are disengaged, and push left and right side plates toward arrow 🅓 to remove the cassette compartment assembly.

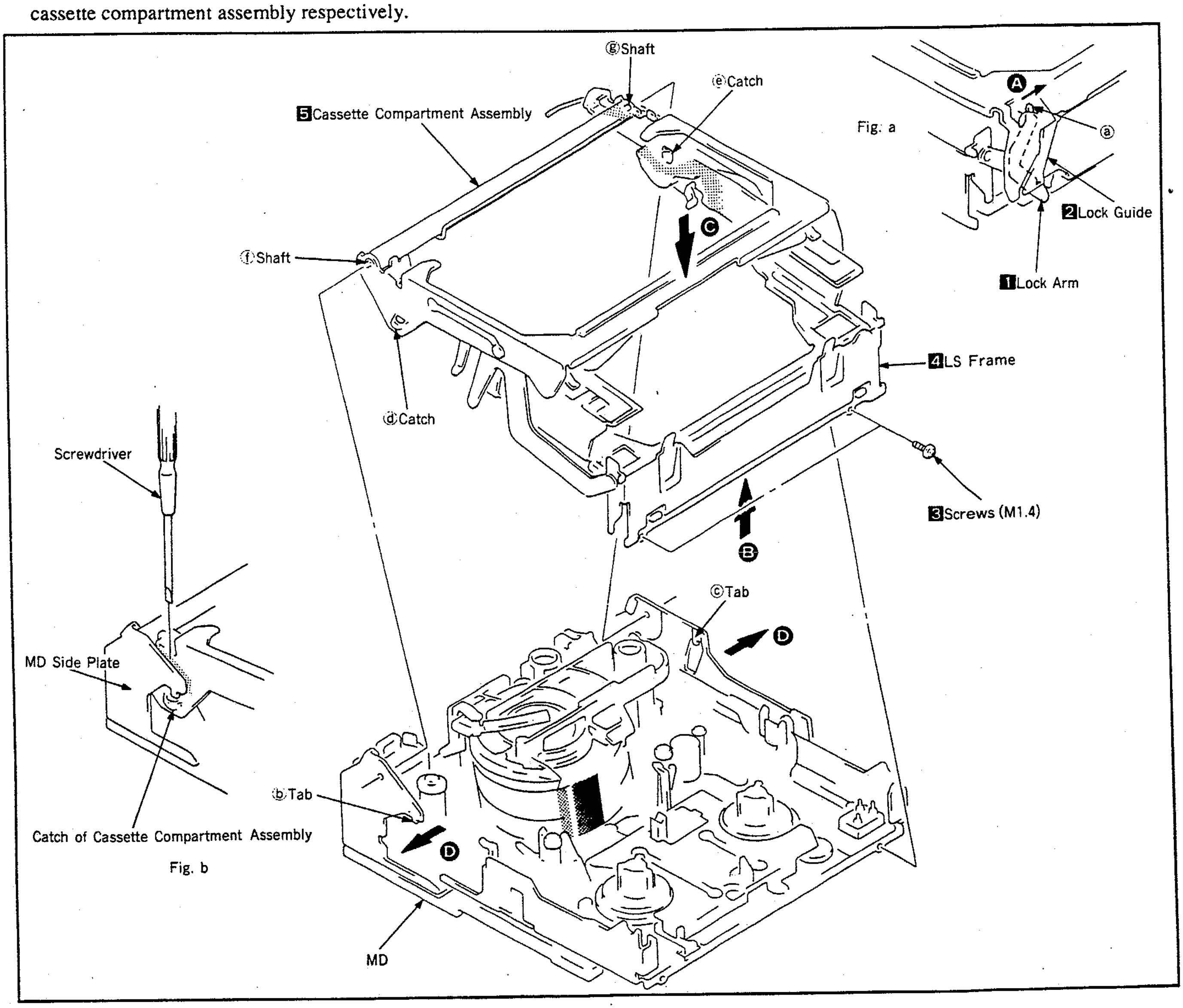

ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
Fig. a
🅐
ⓐ
❷Lock Guide
❶Lock Arm
🅒
ⓕShaft
❹LS Frame
ⓓCatch
Screwdriver
❸Screws (M1.4)
🅑
ⓒTab
🅓
MD Side Plate
ⓑTab
Catch of Cassette Compartment Assembly
Fig. b
🅓
MD

Fig. 1

2. Mounting (Fig. 2)

1) Select the USE mode.
2) Draw the cassette holder ❻ of cassette compartment assembly ❺ toward the arrow 🅔, and lower the LS frame ❹ toward the arrow 🅕.
3) With the cassette compartment assembly ❺ tilted by about 45° against MD, insert shafts ⓕ and ⓖ of cassette compartment assembly into holes ⓗ and ⓘ of MD side plate respectively.

   At this time, the part ⓙ of torsion bar must be positioned on the side ⓚ of LS flexible board (FP-443) (not on the side ⓛ), as shown in Fig. c.
4) Holding holes ⓗ and ⓘ of MD side plate, press the cassette compartment assembly ❺ so that its catches ⓓ and ⓔ are engaged with tabs ⓑ and ⓒ of MD side plate. In such a case, the lock arm ❶ of cassette compartment assembly must be inserted into a groove in the guide rail ❼ on the MD side plate as shown in Fig. d.
5) Insert left and right side plates ⓜ and ⓝ of LS frame ❹ inside the LS chassis ❽.
6) Push down the cassette compartment to lock.

Note : Make sure that the shafts ⓕ, ⓖ and the tabs ⓞ, ⓟ are set in the MD side plate properly.

7) Tighten two screws ❸.

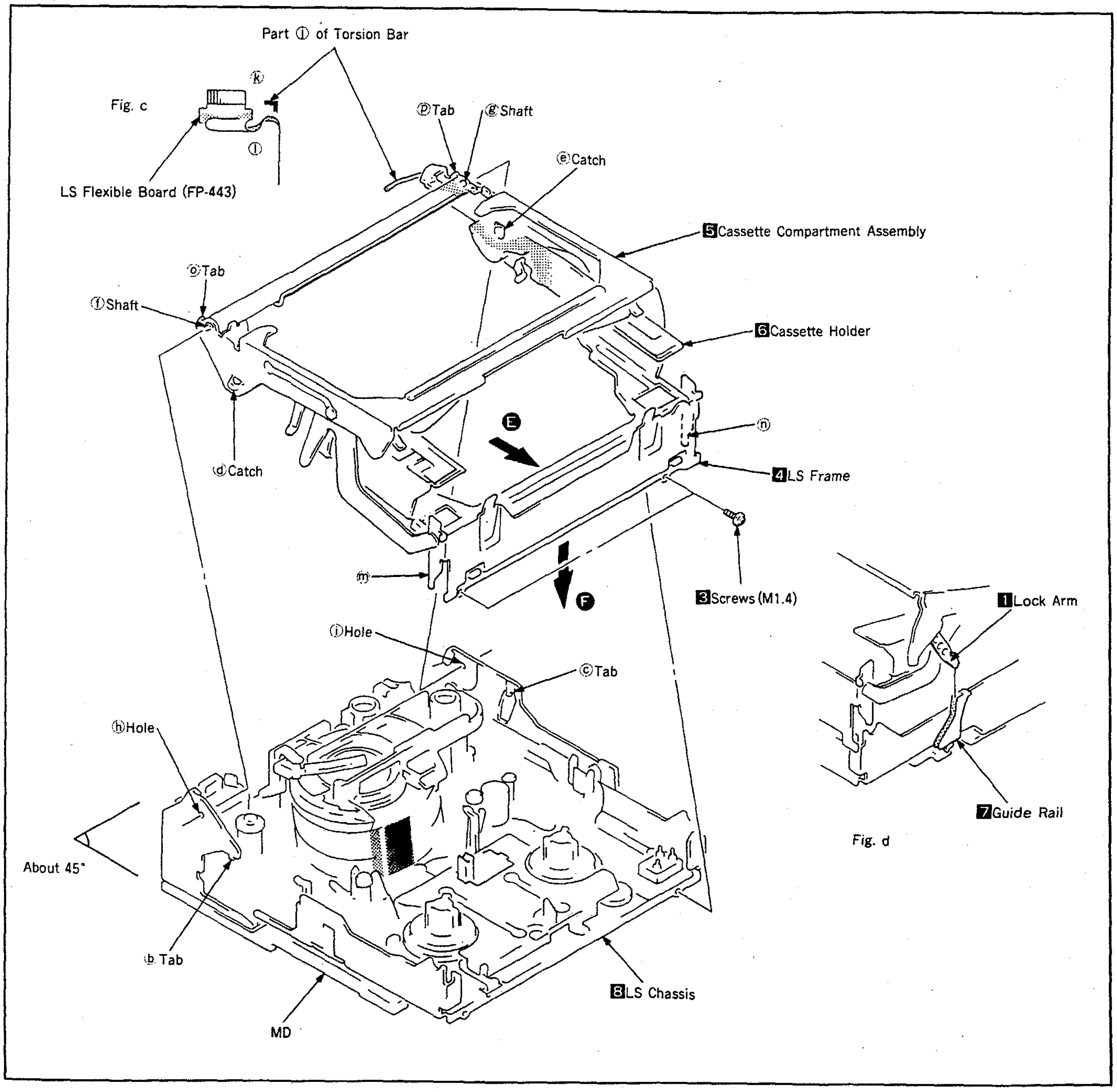

Part ⓙ of Torsion Bar
Fig. c
ⓚ
ⓛ
LS Flexible Board (FP-443)
ⓟTab
ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
ⓞTab
ⓕShaft
❻Cassette Holder
🅔
ⓝ
ⓓCatch
❹LS Frame
ⓜ
🅕
❸Screws (M1.4)
❶Lock Arm
ⓘHole
ⓒTab
ⓗHole
❼Guide Rail
Fig. d
About 45°
ⓑ Tab
❽LS Chassis
MD

Fig. 2

1-2. OPERATION WITH CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera removed. (Make the mechanical deck ready to operate.)
2) Place the cap 2 on the Reflector C 1.
3) Press the pin of the push switch 3 (ON state) and fix it with adhesive tape 4 in that state.

Note : Press the asterisked (✱) pin to set the REC mode.
(This is not required for the other modes.)

4) Push the cassette compartment DOWN switch 5 in an arrow direction as shown in Fig. a.

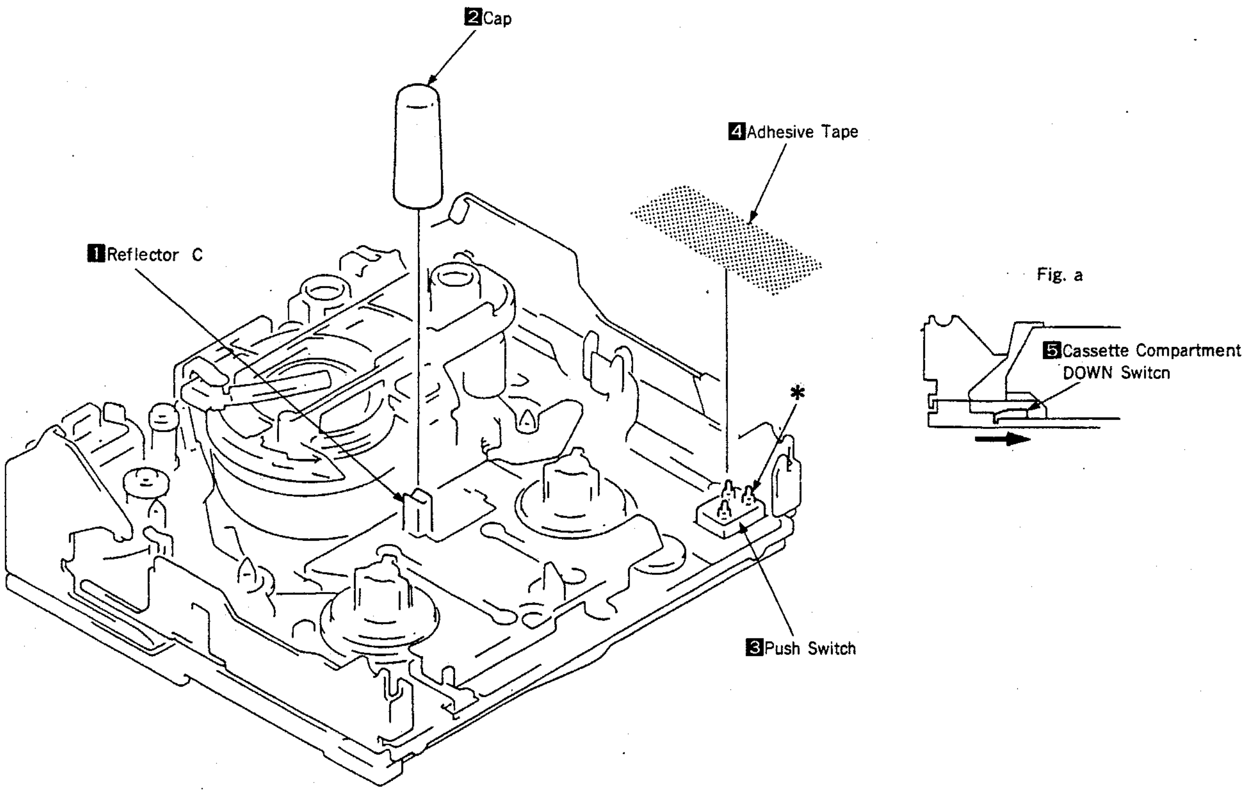

2Cap
4Adhesive Tape
1Reflector C
*
3Push Switch
Fig. a
5Cassette Compartment DOWN Switcn

Fig. 3

1-3. HANDLING OF MODE SELECTOR

- Stick the MD process table label to the mode selector IV panel, then mount the panel on the mode selector. U,U', FL, O, O' and A mechanisms have different mode indications respectively. Select your disired type. (Fig.4)

1 Construction (Fig.5)

2 Connection (Fig.6)

For CCD-FX410 series

1) Insert the FP-425 flexible connector 1 and M-SW connector 2 into the mode selector IV conversion connector 3 respectively.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, END, EJECT, USE, LOAD, READY,TURN, REC and FF light up in that order.
4) When changing over from the FF mode back to the END mode, press the left M mode selector botton to select your desired mode.

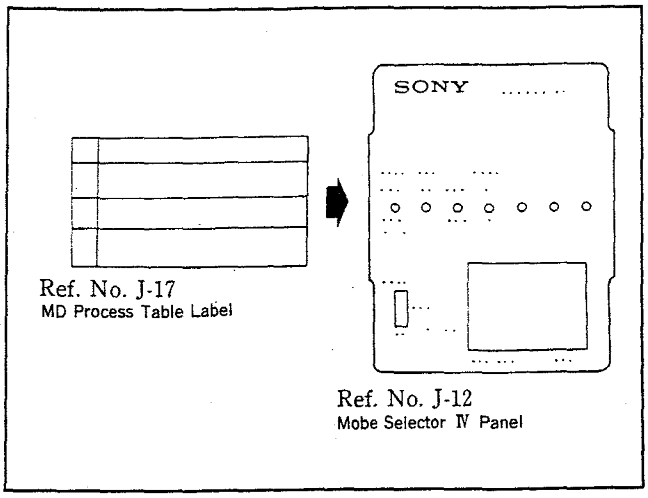

SONY
Ref. No. J-17
MD Process Table Label
Ref. No. J-12
Mobe Selector Ⅳ Panel

Fig. 4

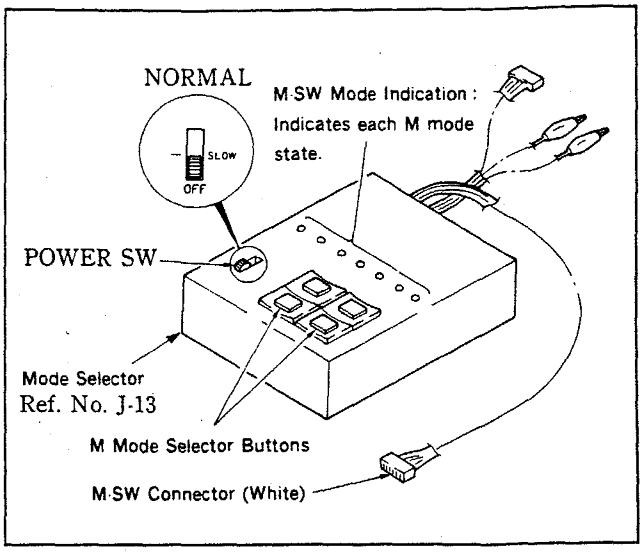

NORMAL
SLOW
OFF
M·SW Mode Indication : Indicates each M mode state.
POWER SW
Mode Selector
Ref. No. J-13
M Mode Selector Buttons
M·SW Connector (White)

Fig. 5

For CCD-FX410 series

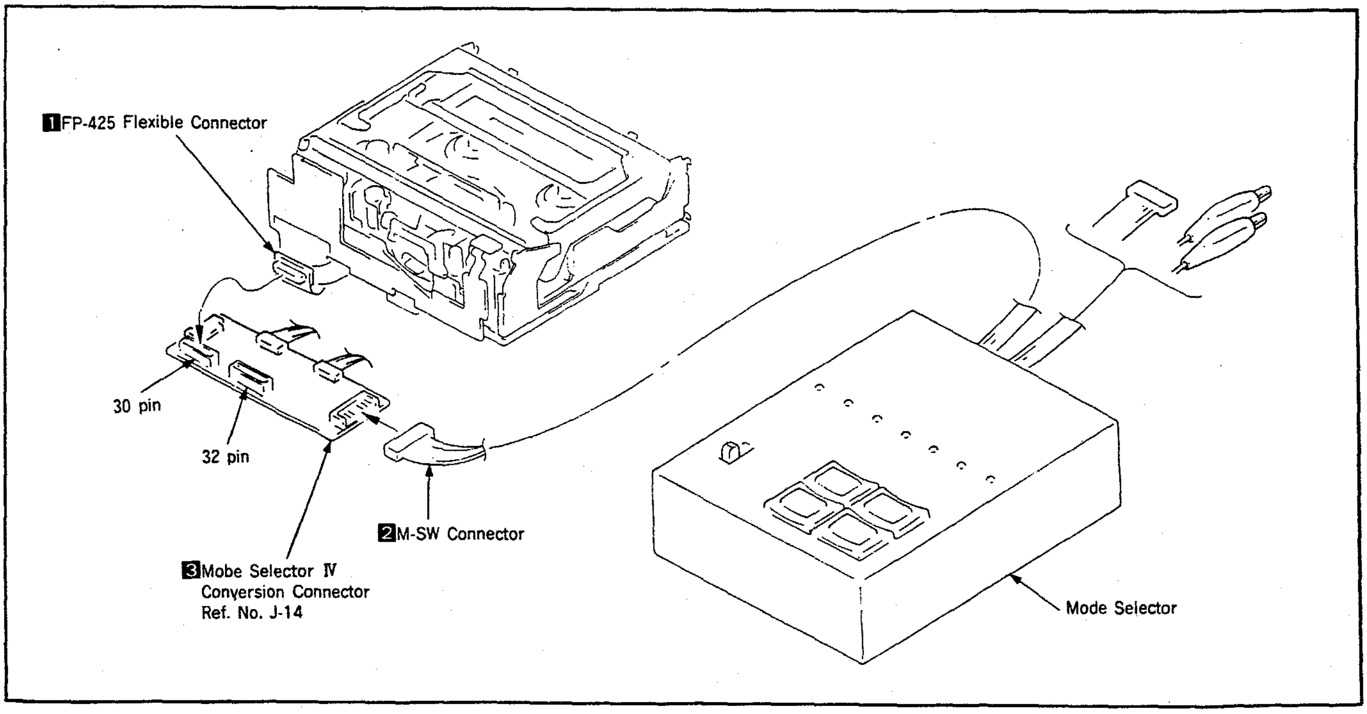
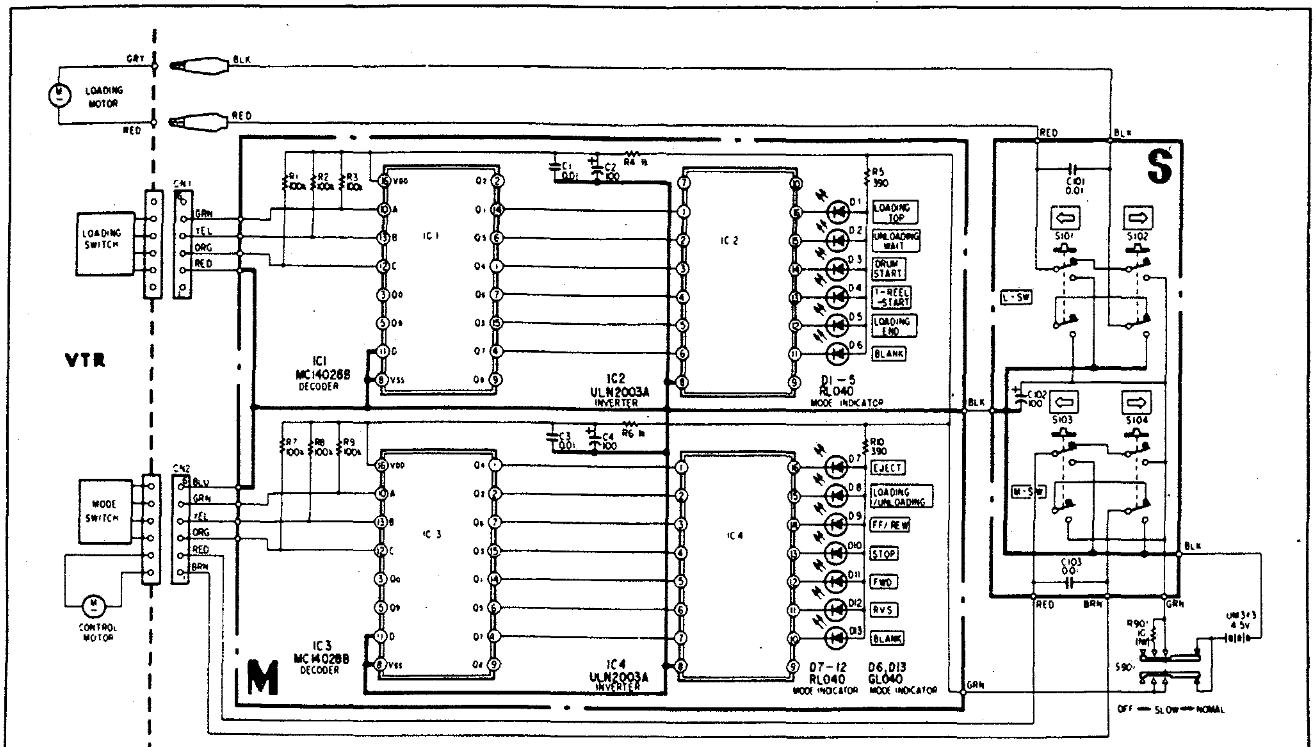

1 FP-425 Flexible Connector
30 pin
32 pin
2 M-SW Connector
3 Mobe Selector Ⅳ Conversion Connector Ref. No. J-14
Mode Selector

Fig. 6

1-4. MODE SELECTOR SCHEMATIC DIAGRAM


GRY
BLK
LOADING MOTOR
RED
VTR
LOADING SWITCH
CN1
GRN
YEL
ORG
RED
MODE SWITCH
CN2
BLU
GRN
YEL
ORG
RED
BRN
CONTROL MOTOR
R1 100k
R2 100k
R3 100k
C1 0.01
C2 100
R4 1k
IC1
MC14028B
DECODER
IC2
ULN2003A
INVERTER
R5 390
D1
D2
D3
D4
D5
D6
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL -START
LOADING END
BLANK
D1 – 5
RL040
MODE INDICATOR
R7 100k
R8 100k
R9 100k
C3 0.01
C4 100
R6 1k
IC3
MC14028B
DECODER
IC4
ULN2003A
INVERTER
R10 390
D7
D8
D9
D10
D11
D12
D13
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
D7 – 12
RL040
MODE INDICATOR
D6, D13
GL040
MODE INDICATOR
M
S
RED
BLK
C101 0.01
S101
S102
L-SW
C102 100
S103
S104
M-SW
C103 0.01
RED
BRN
GRN
R901 10 (1W)
S901
UM3×3 4.5V
OFF ⟵ SLOW ⟵ NOMAL

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0 : INPUT LEVEL L
1 : INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL - START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END ⟵ LOADING TOP
M-SW RVS ⟶ EJECT

⇨ L-SW LOADING TOP ⟵ LOADING END
M-SW EJECT ⟶ RVS

1-5. MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description		
		CAPACITOR		
C1	1-108-579-00	MILER	0.01μF	50V
C2	1-123-333-00	ELECT	100μF	24V
C3	1-108-579-00	MILER	0.01μF	50V
C4	1-123-333-00	ELECT	100μF	24V
C101	1-108-579-00	MILER	0.01μF	50V
C102	1-123-333-00	ELECT	100μF	24V
C103	1-108-579-00	MILER	0.01μF	50V
		DIODE		
D1	8-719-812-31	DIODE TLR123		
D2	8-719-812-31	DIODE TLR123		
D3	8-719-812-31	DIODE TLR123		
D4	8-719-812-31	DIODE TLR123		
D5	8-719-812-31	DIODE TLR123		
D6	8-719-812-33	DIODE TLG123A		
D7	8-719-812-31	DIODE TLR123		
D8	8-719-812-31	DIODE TLR123		
D9	8-719-812-31	DIODE TLR123		
D10	8-719-812-31	DIODE TLR123		
D11	8-719-812-31	DIODE TLR123		
D12	8-719-812-31	DIODE TLR123		
D13	8-719-812-33	DIODE TLG123A		

Ref. No	Part No.	Description		
		IC		
IC1	8-752-240-28	IC TC4028BP		
IC2	8-752-120-03	IC μPA2003C		
IC3	8-759-240-28	IC TC4028BP		
IC4	8-759-120-03	IC μPA2003C		
		RESISTOR		
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL	10	1W

2. PERIODIC CHECK AND MAINTENANCE

- *Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.*

2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

2-2. CLEANING OF TAPE PATH (Fig.7)

1) In the USE mode, clean the tape running system (TG - 1,- 2,- 3,- 4,- 5, - 6, - 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

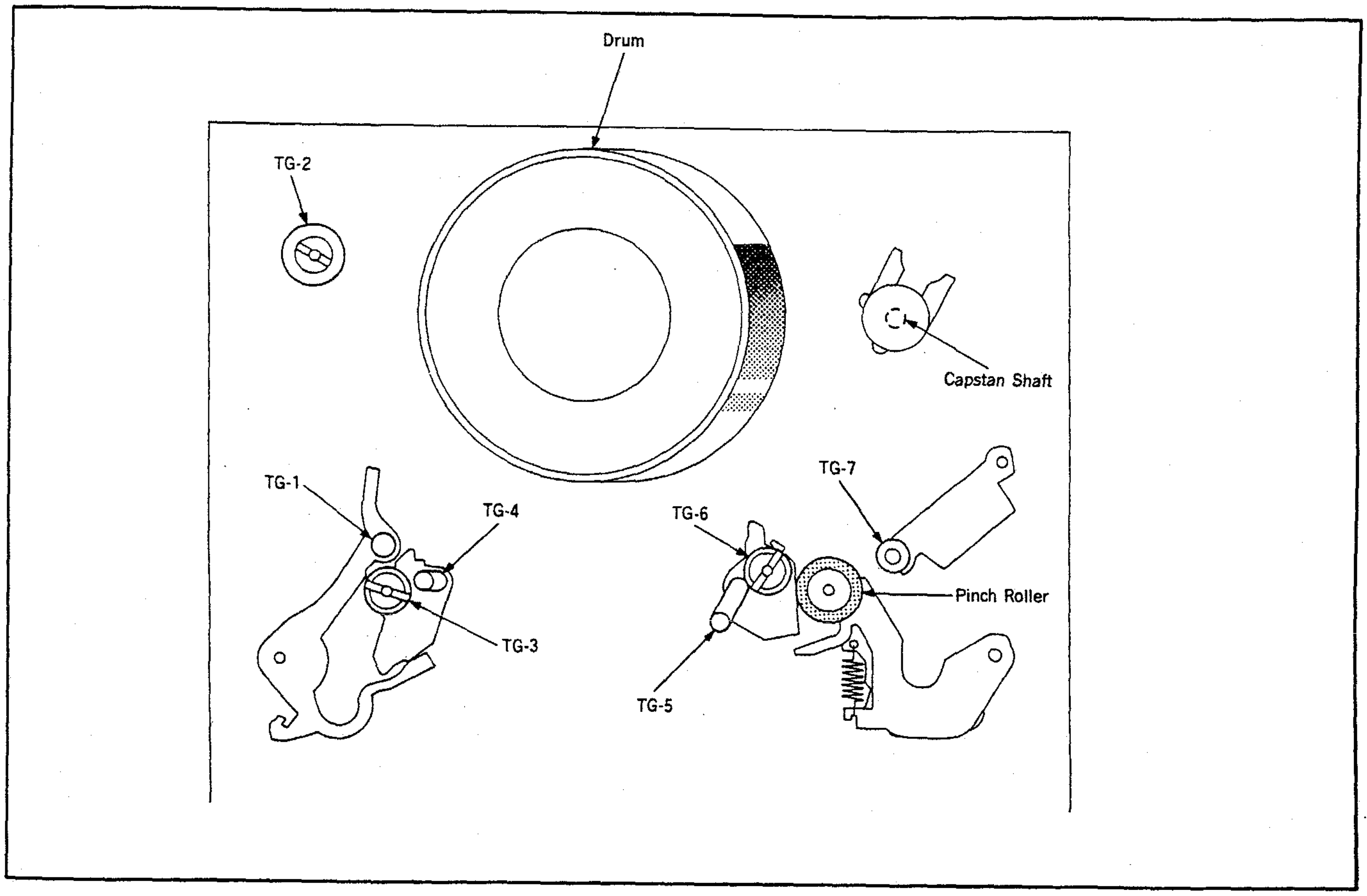


Fig. 7

2-3. PERILDIC CHECK ITEMS

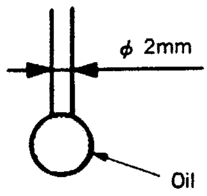
Location of Maintenance and check		Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-944-539-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-304-A
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different viscosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT - 68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

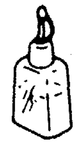


2-4. Service jigs list

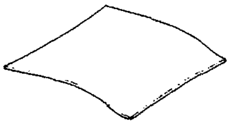
Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector Ⅳ panel	J-6082-105-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector Ⅳ conversion connector	J-6082-167-A		
J-15	FWD B.T. adjusting driver	J-6082-182-A		
J-16	Adjusting remote controller	J-6082-053-B		Tape path (Setting of PATH mode)
J-17	MD process table label	J-6082-166-A		

Other equipment
- Oscilloscope
- Analog tester (20 kΩ)

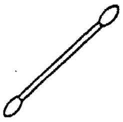
J-1



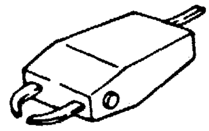
J-2



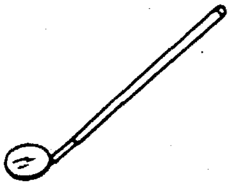
J-3



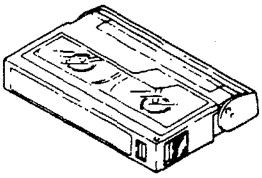
J-4



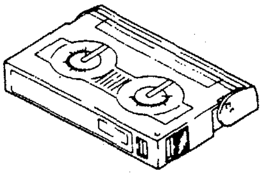
J-5



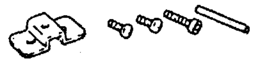
J-6



J-9

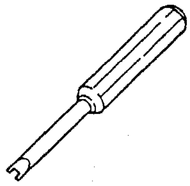


J-10

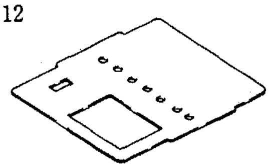


(Attached to the maintenance rotary upper drum)

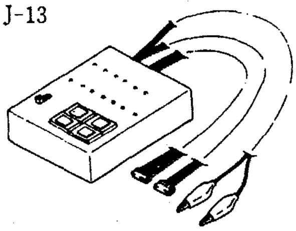
J-11



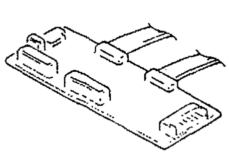
J-12



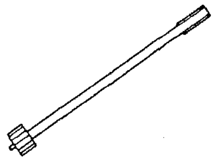
J-13



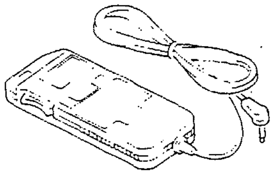
J-14



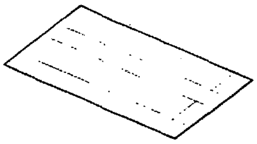
J-15



J-16



J-17



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-13) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1. RETAINER, GOOSENECK ASSEMBLY (Fig. 8)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove a screw 1.
3) Remove the Retainer, Gooseneck assembly 2.

2. Mounting

1) Mount the Retainer, Gooseneck assembly 2 with its two tabs and holes of LS chassis engaged with its hole and a boss of LS chassis.
2) Tighten the screw 1.
3) Referring to 1-1, mount the cassette compartment assembly.

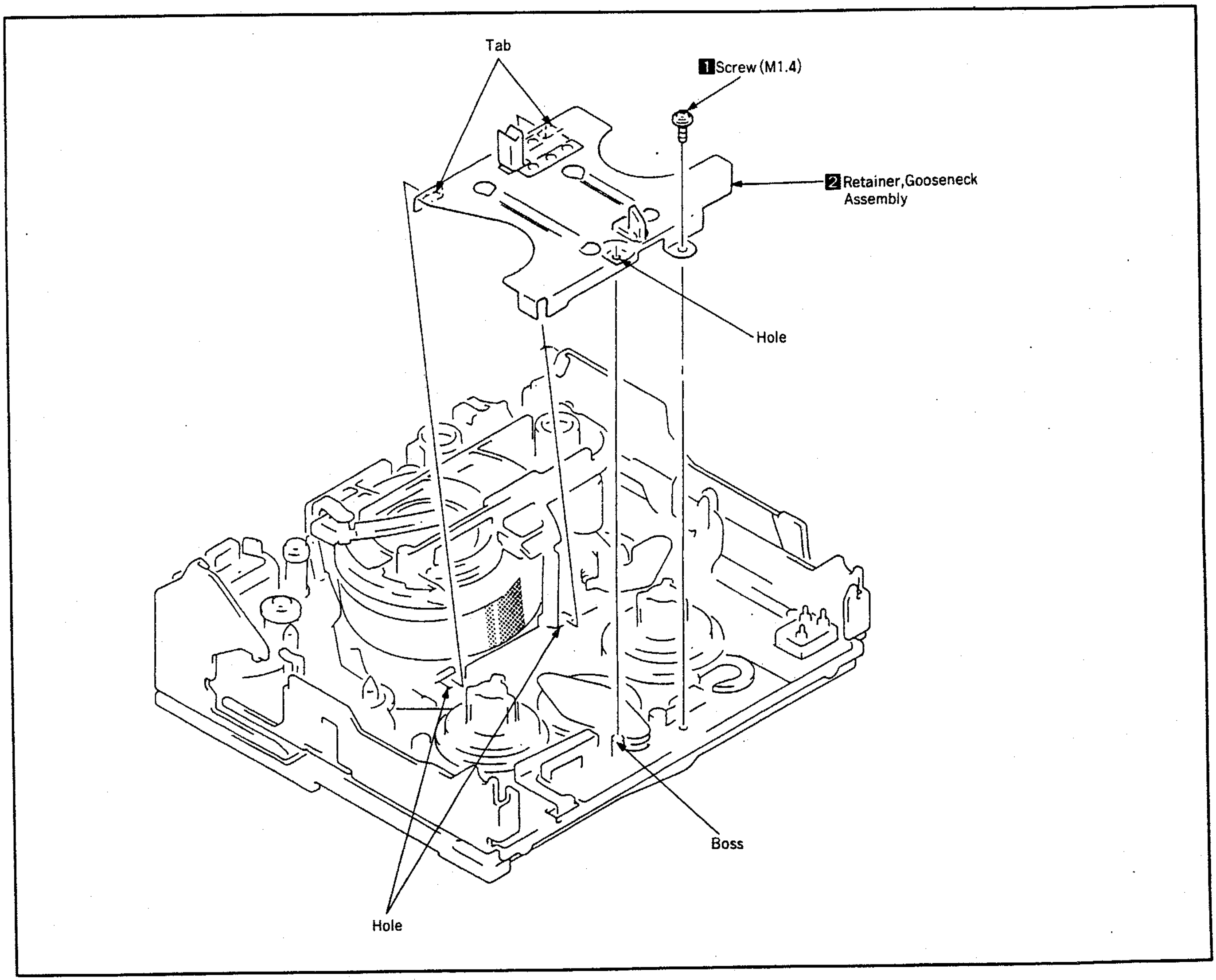


Fig. 8

3-2. PROTECTOR BASE ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screws 1, then the protector base assembly 2.

2. Mounting

1) Mount the protector base assembly 2 with its three holes engaged with two dowels of mechanical chassis, and a dowel of TG-5 Base Holder 3.
2) Tighten two screws 1.
3) Referring to 1-1, mount the cassette compartment assembly.

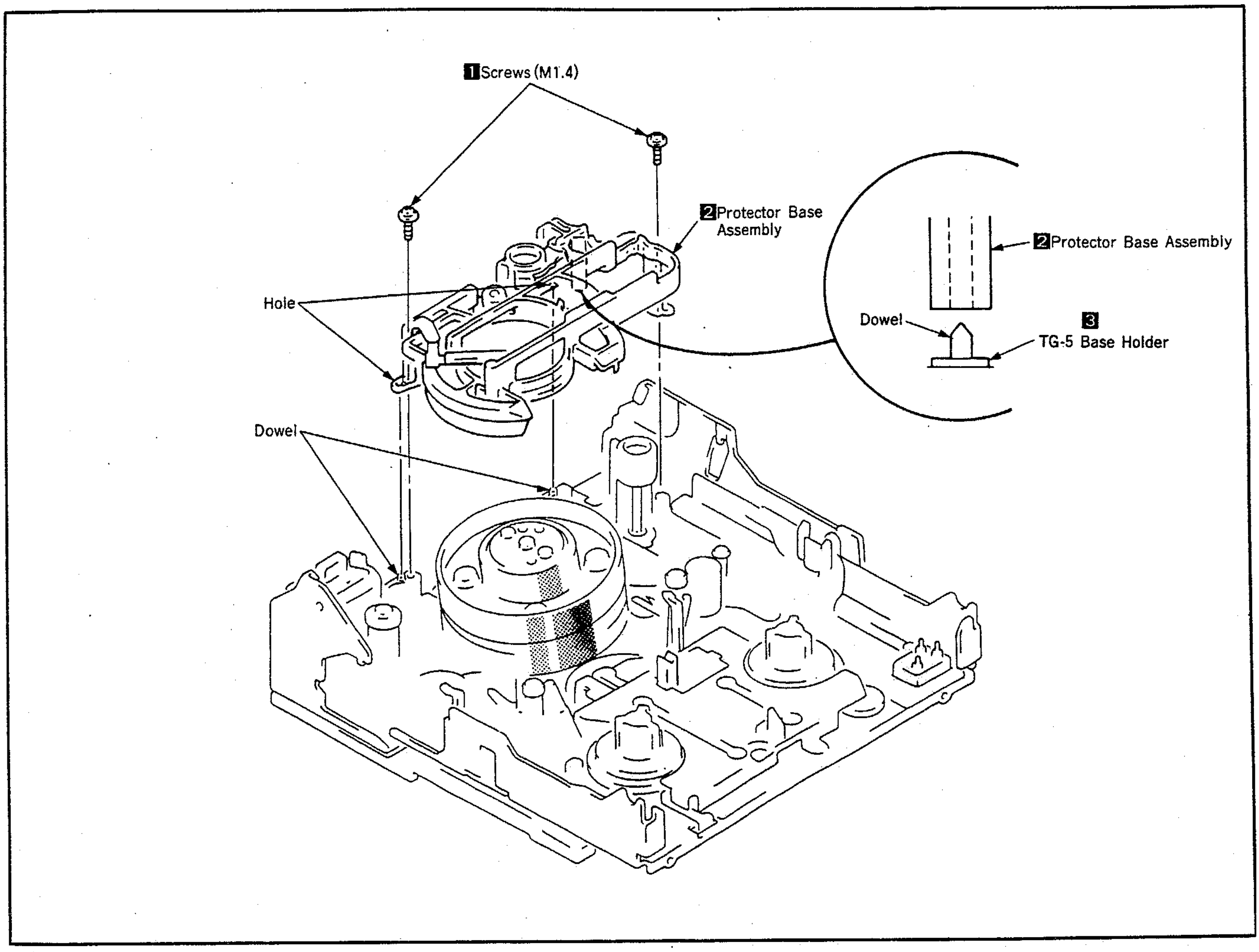

1 Screws (M1.4)
2 Protector Base Assembly
Hole
Dowel
2 Protector Base Assembly
Dowel
3 TG-5 Base Holder

Fig. 9

3-3. DRUM ASSEMBLY (Fig. 10)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-2, remove the protect base assembly.
3) Disconnect the connector of FP-444 flexible board ❶ on the back of MD.
4) Remove three screw ❷, then the drum assembly ❸.

Note : Do not touch the outer surfaced of drum (hold portions Ⓐ and Ⓑ of drum).

2. Mounting

1) Mount the drum assembly ❸ while aligning with two dowels ⓐ of chassis.

Note : Do not touch the outer surfaced of drum (hold portions Ⓐ and Ⓑ of drum).

2) Tighten three screw assemblies ❷ in the order of 1, 2 and 3.

Note : Tighten lightly not to deform the drum lead.

3) Apply a screw locking agent to prevent screws ftom loosening.

Note : In tightening the screws, pushing down the drum extremely will allow the drum to float up.

4) Connect the connector of FP-444 flexible board ❶ on the back of MD.
5) Referring to 3-2, mount the protect base assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

Note : After mounting, make tape path adjustment in Section 4.

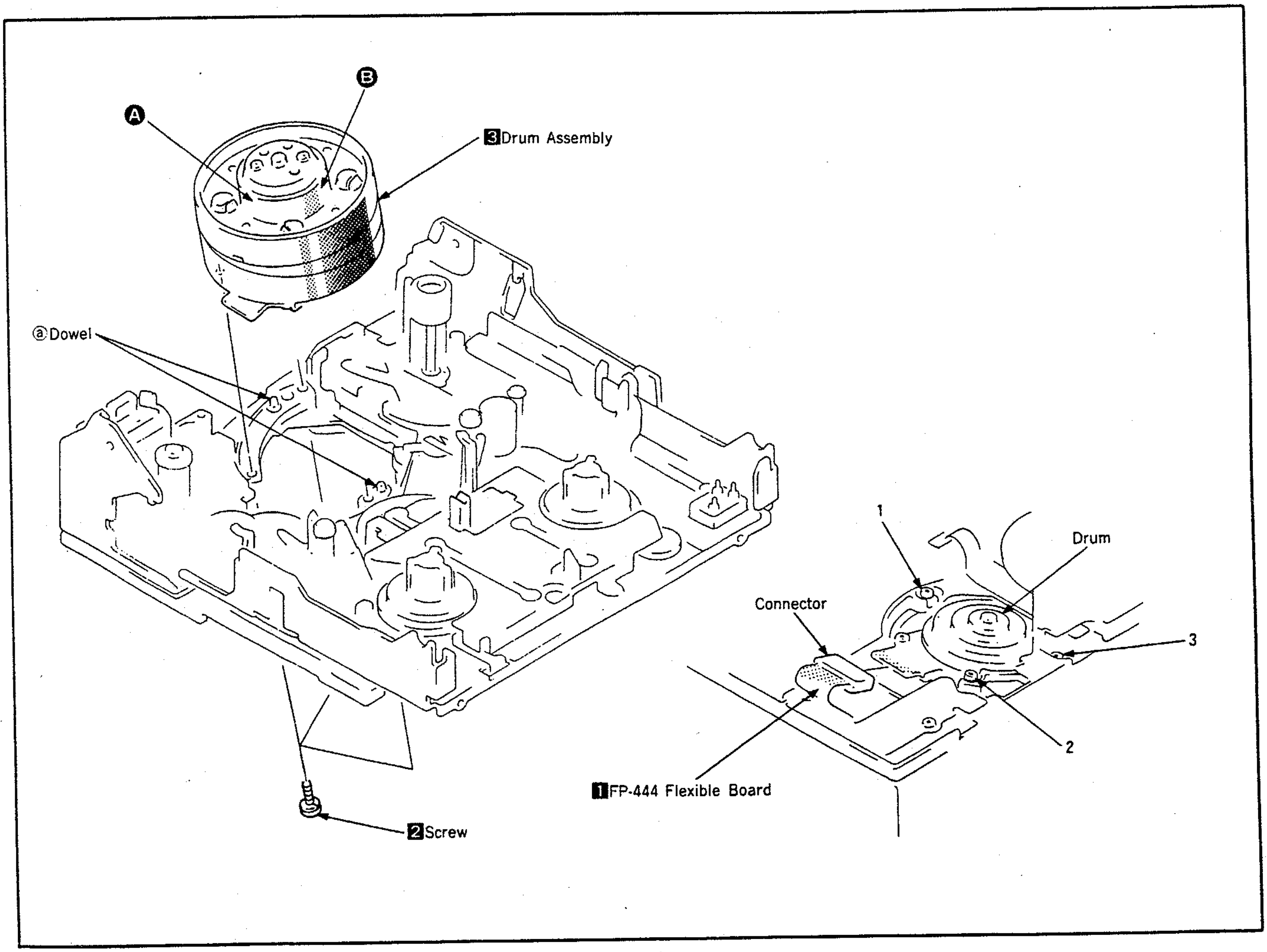


Fig. 10

3-4. CAPSTAN MOTOR ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screw **1**, then the capstan cover **2**.
3) Remove the screw **3**, then the capstan motor assembly **4**.

2. Mounting

1) Mount the capstan motor assembly **4** and tighten the screw **3**.

Note : In mounting the capstan motor assembly, hold lightly the capstan motor assembly until the rotor gear aligns with the change gear Assy, then insert fully the assembly when both gears are engaged completely by manually rotating the rotor. (Take care not to damage the change gear Assy.)

2) Mount the capstan cover **2** and tighten two screws **1**.
3) Referring to 1-1, mount the cassette compartment assembly.

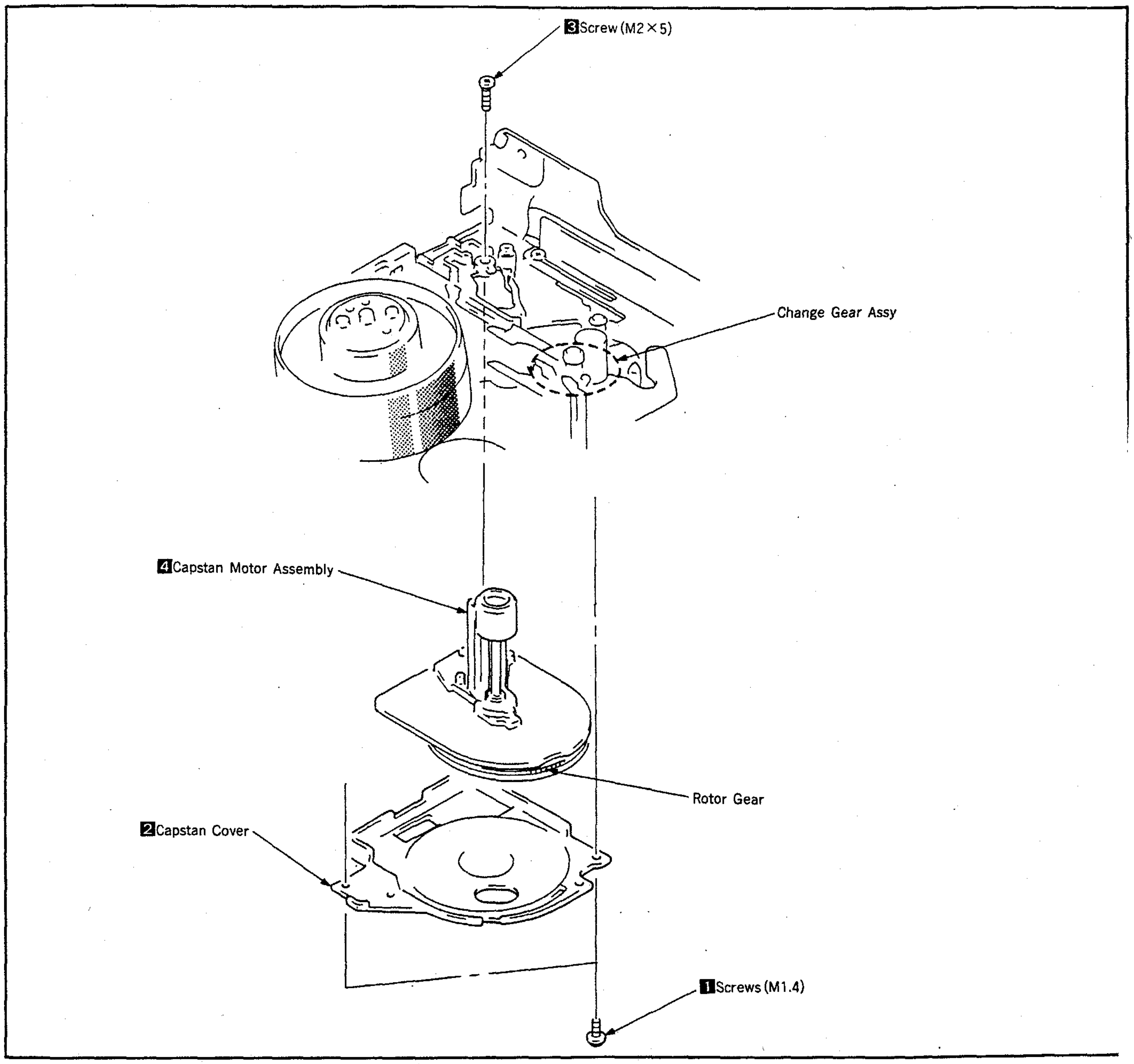

3 Screw (M2×5)
Change Gear Assy
4 Capstan Motor Assembly
Rotor Gear
2 Capstan Cover
1 Screws (M1.4)

Fig. 11

3-5. TAKE-UP REEL TABLE ASSEMBLY AND T- SOFT ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Remove the take-up reel table assembly ❶.
4) Remove the T soft assembly ❷, then the T soft arm ❸.

2. Mounting

1) Mount the T soft arm ❸ with its long hole ⓒ engaged with the boss ⓓ of LS chassis.
2) Mount the T soft assembly ❷ with its tab ⓐ engaged with a square hole ⓑ of T soft arm, as shown in Fig. a.
3) Mount the take-up reel table assembly ❶ and rotate it toward the arrow Ⓐ to be latched with T hard claw.
4) Referring to 3-1. mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

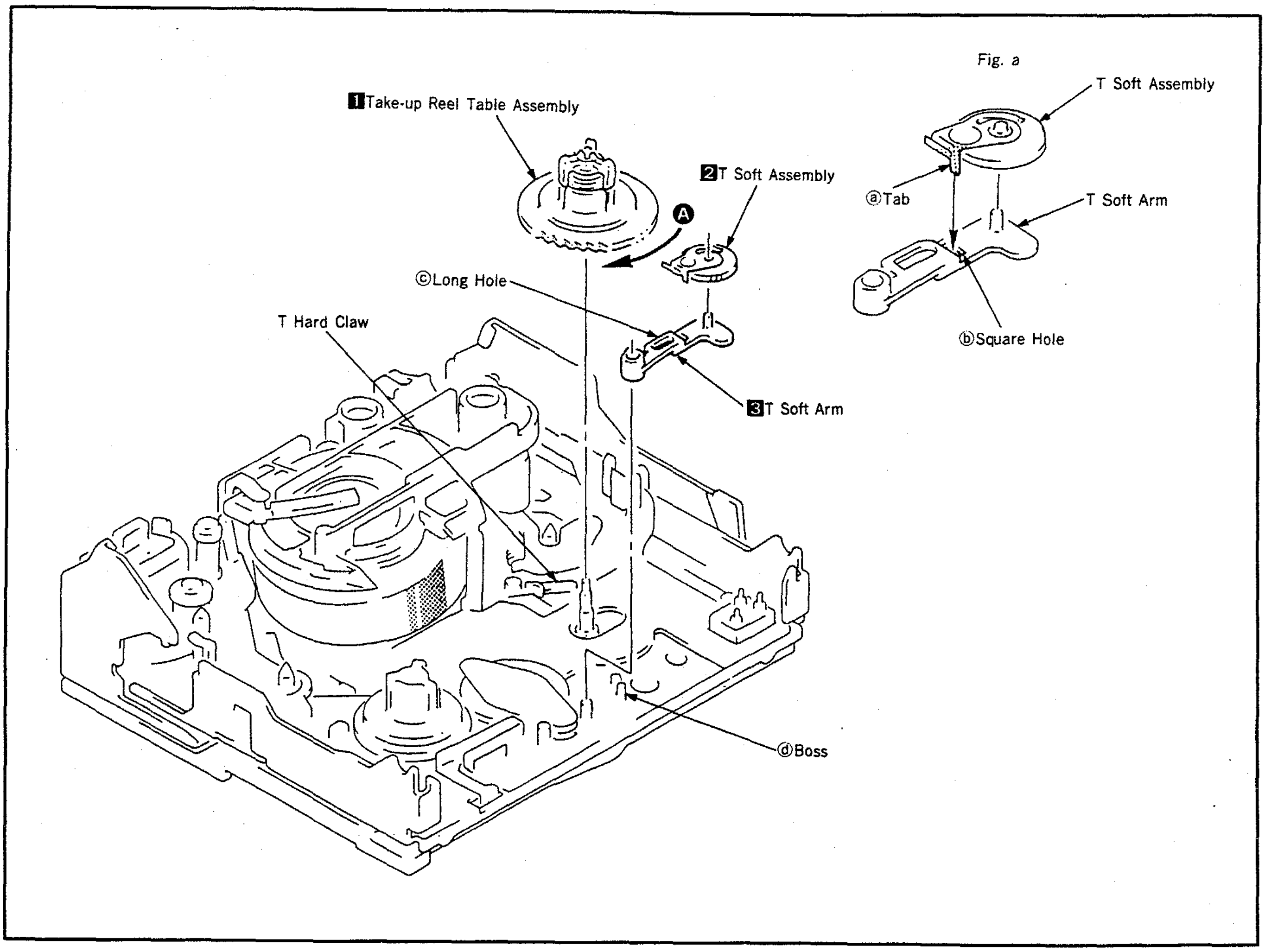

❶Take-up Reel Table Assembly
❷T Soft Assembly
Ⓐ
ⓒLong Hole
T Hard Claw
❸T Soft Arm
ⓓBoss
Fig. a
T Soft Assembly
ⓐTab
T Soft Arm
ⓑSquare Hole

Fig. 12

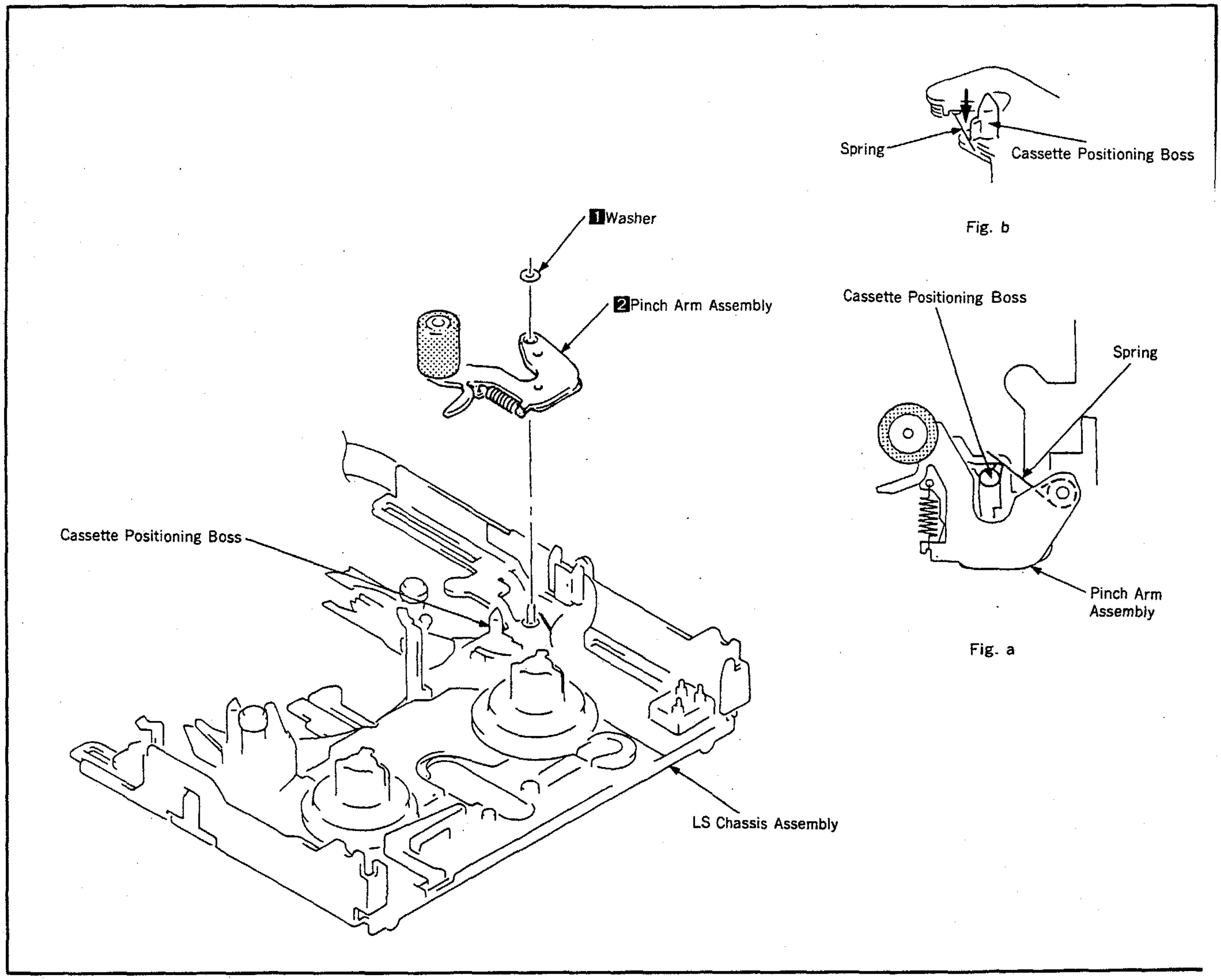
3-6. PINCH ARM ASSEMBLY (Fig. 13)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Select the READY mode.
3) Remove a washer **1**, then the pinch arm assembly **2**.

2. Mounting

1) Select the READY mode.
2) Hooking a spring of pinch arm assembly **2** to the cassett positioning boss on the chassis, mount the pinch arm assembly on the shaft of LS chassis assembly as shown in Fig. a.
3) Push in the spring with tweezers up to the root of boss a shown in Fig. b.
4) Mount the washer **1**.
5) Referring to 1-1, mount the cassette compartment assembly.



Spring
Cassette Positioning Boss
Fig. b
1 Washer
2 Pinch Arm Assembly
Cassette Positioning Boss
Spring
Cassette Positioning Boss
Pinch Arm Assembly
Fig. a
LS Chassis Assembly

Fig. 13

3-7. LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Remove a screw ❶, TG-5 base holder ❷, and LS flexible board ❸.
5) Remove a lock washer ❹, then the gooseneck as sembly ❺.
6) Remove four screws ❻, then the LS chassis assembly ❼.

2. Mounting

1) Select the USE mode.
2) Confirm that the T hard claw and the outsert on the back of LS chassis are positioned as shown in Fig. a. (The T hard claw must be higher than corner ⓐ of chassis hole.) If not high, turn the outsert in the arrow direction while pushing the T hard claw from LS chassis to the chassis.
3) Sliding the GL slider, align the top edge of long hole ⓑ in GL slider with the edge face ⓒ of LS chassis hole as shown in Fig. b.
4) Mount the LS chassis assembly ❼ on the chassis.

Note : At this time, aligh a dowel ⓓ on LS chassis with a long hole ⓔ of No.7 guide on chassis, a long hole of GL slider with a GL arm pin, a groove of LS cam plate with an LS arm pin respectively as shown in Fig. c and d.

5) Tighten four screws ❻.
6) Mount the LS flexible board ❸ and TG-5 base holder ❷,then tighten the screw ❶.
7) Mount the Gooseneck assembly ❺ and fix it with a washer ❹.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.
10) Referring to 1-1, mount the cassette compartment assembly.

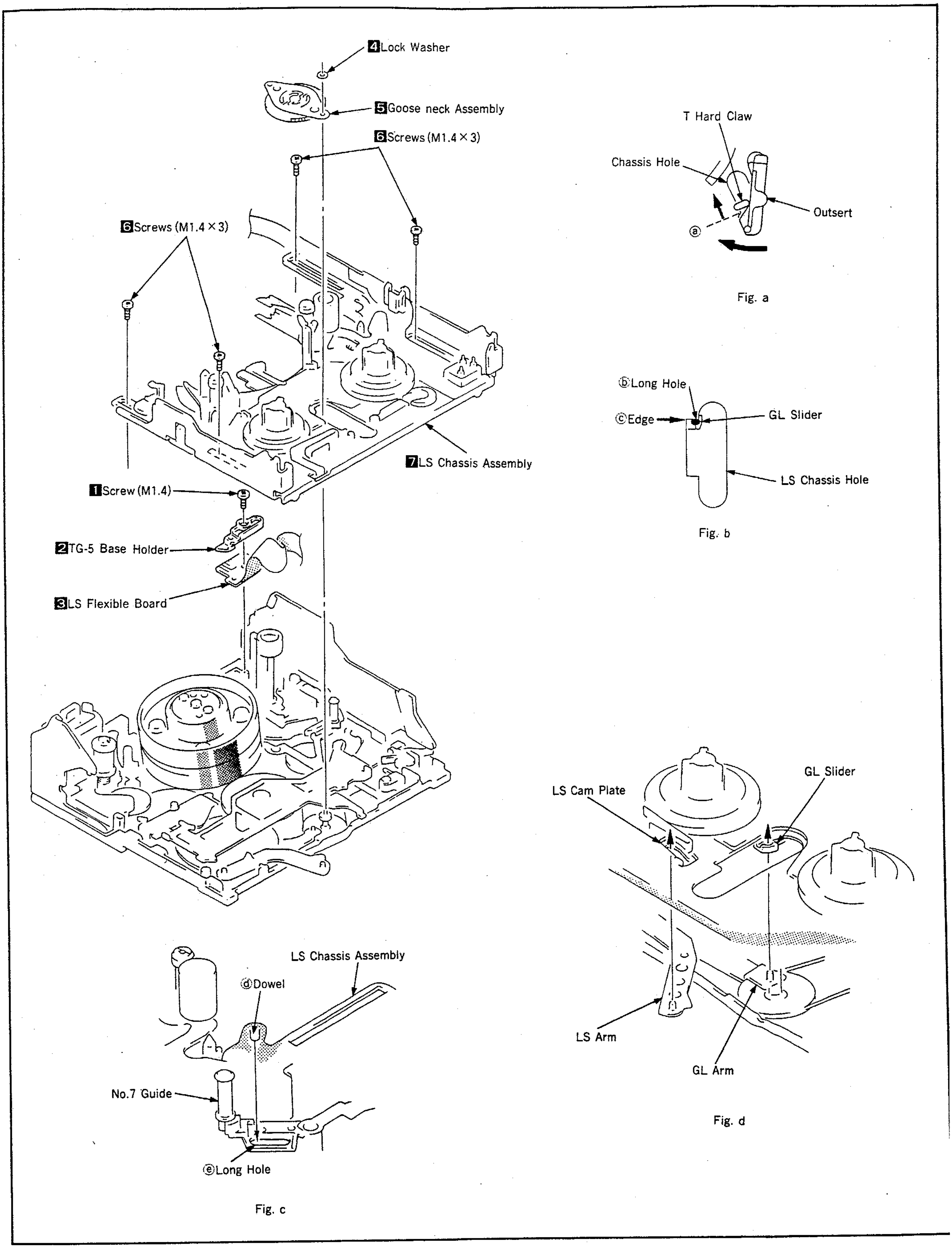

❹Lock Washer
❺Goose neck Assembly
❻Screws (M1.4 × 3)
❻Screws (M1.4 × 3)
❼LS Chassis Assembly
❶Screw (M1.4)
❷TG-5 Base Holder
❸LS Flexible Board
T Hard Claw
Chassis Hole
Outsert
ⓐ
ⓑLong Hole
ⓒEdge
GL Slider
LS Chassis Hole
LS Cam Plate
GL Slider
LS Arm
GL Arm
LS Chassis Assembly
ⓓDowel
No.7 Guide
ⓔLong Hole

Fig. a

Fig. b

Fig. c

Fig. d

Fig. 14

3-8. GUIDE BASE T ASSEMBLY AND GUIDE BASE S ASSEMBLY (Fig. 15, 16)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Push in the GL slider 1 toward the arrow Ⓐ, and remove the guide base T assembly 2 and guide base S assembly 3 from the guide rail respectively as shown in Fig. 15.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T sofr assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

6) Turning the guide base T assembly 2 and guide base S assembly 3 respectively, align the shaft to hole to remove as shown in Fig. a.

2. Mounting

1) Turning the guide base T assembly 2 and guide base S assembly 3 respectively, align the shaft with a hole to mount as shown in Fig. a (Fig. 15).
2) On the back side of chassis, insert the guide arm T assembly 4, guide arm S assembly 5 and GL slider 1 from position shown in Fig.b to position shown in Fig. c. Also, aligning the guide base T assembly 2 and guide base S assembly 3 with the respective guide rails, push in the GL slider 1 toward the arrow Ⓑ as shown in Fig. 16.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm.

6) Referring to 1-1, mount the cassette compartment assembly.

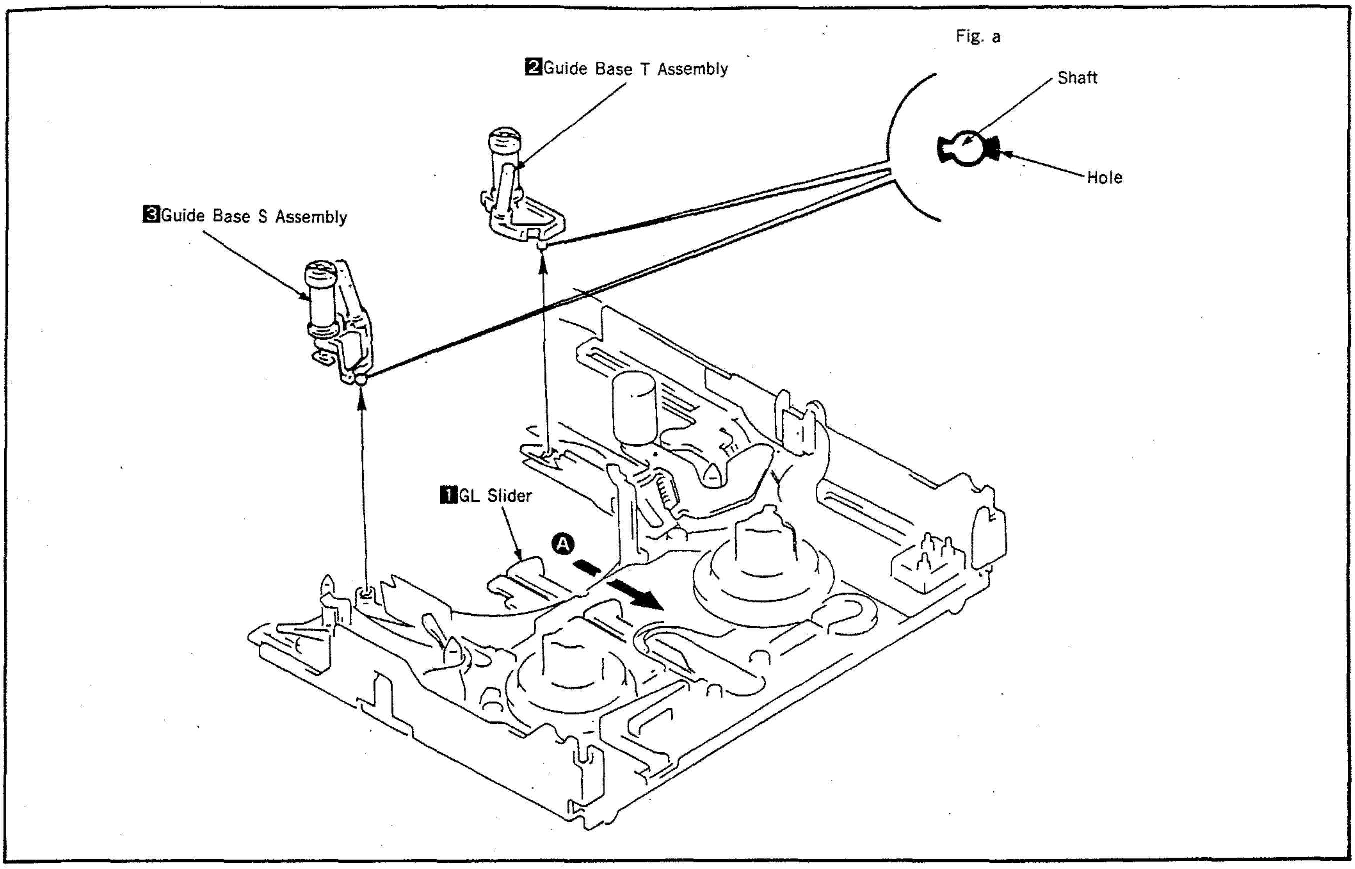


Fig. a
2 Guide Base T Assembly
Shaft
Hole
3 Guide Base S Assembly
1 GL Slider
A

Fig. 15

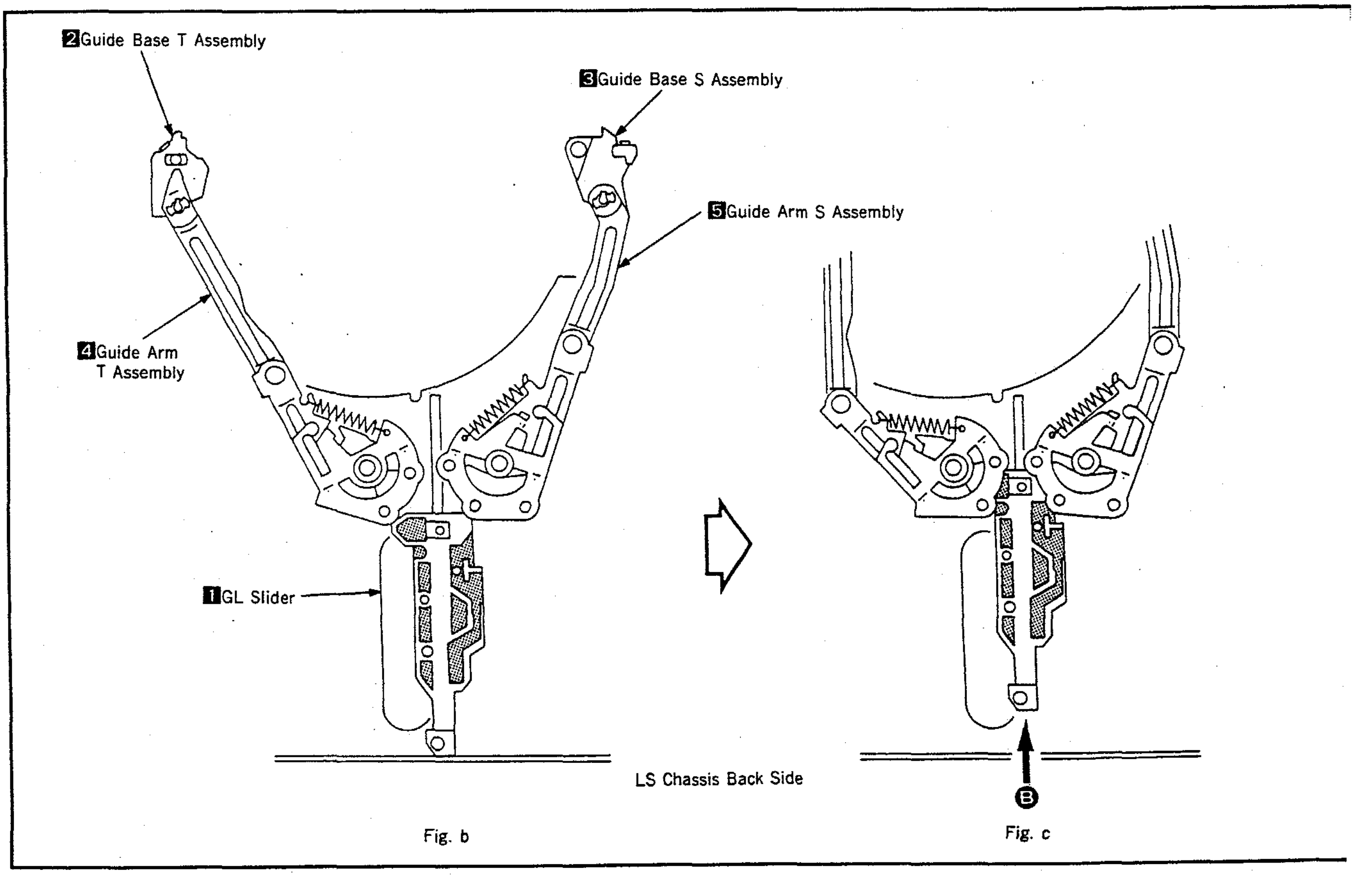

2 Guide Base T Assembly
3 Guide Base S Assembly
5 Guide Arm S Assembly
4 Guide Arm T Assembly
1 GL Slider
LS Chassis Back Side
B

Fig. b

Fig. c

Fig. 16

3-9. GUIDE ARM T ASSEMBLY AND GUIDE ARM S ASSEMBLY (Fig. 17)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base T assembly and guide base S assembly.
6) Remove lock washers ❶, then the guide arm T assembly ❷ and guide arm S assembly ❸ respectively from the back side of chassis.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assmbly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2. Mounting

1) Mount the guide arm T assembly ❷ and guide arm S assembly ❸, then fix them with a lock washer ❶ respectively.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2) Referring to 3-8, mount the guide base T assembly, guide-base S assembly and GL slider.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

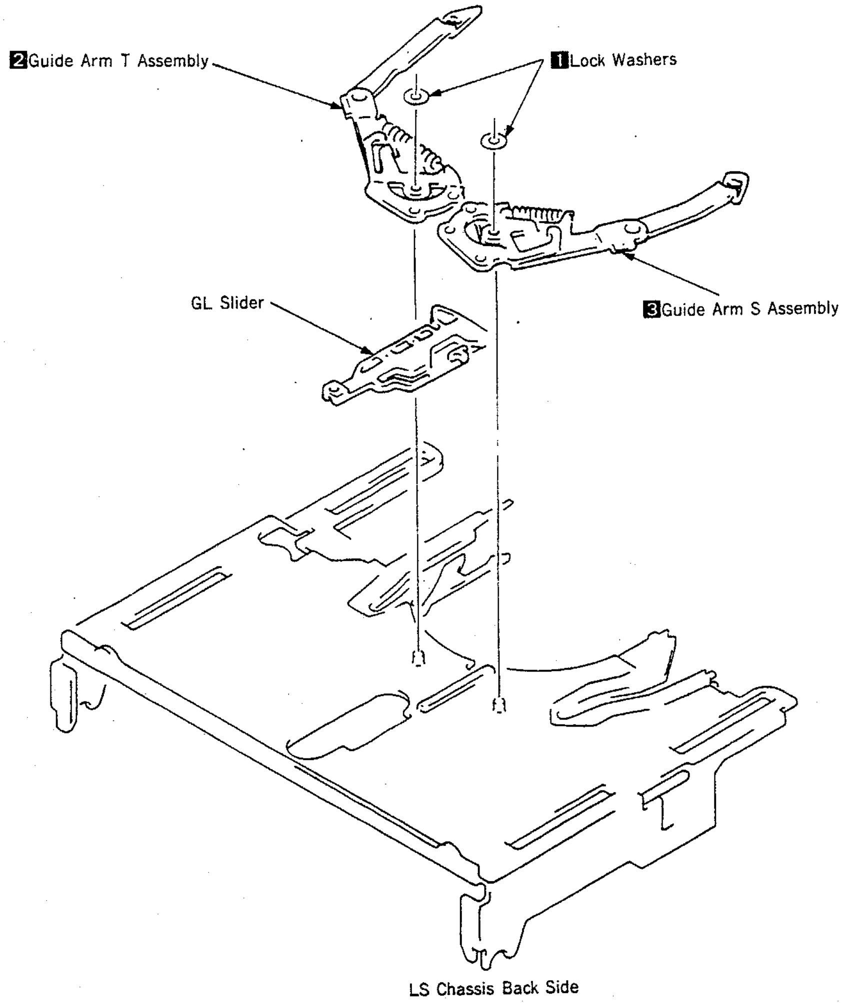


Fig. 17

3-10. SUPPLY REEL TABLE ASSEMBLY AND TG-1 ARM ASSEMBLY (Fig. 18)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base S assembly.
6) Remove a screw 1, then the string 2 from the supply reel table assembly 3. For easy removal of string block 4, insert a flat-blade screwdriver into a groove ⓐ and push it up (Fig. a).
7) Remove the supply reel table assembly 3.
8) Remove a tension coil spring 5.
9) Turn the TG-1 arm assembly 6 up to a portion ⓒ of LS chassis hole in the arrow Ⓐ direction so that its tab ⓑ can be disengaged (Fig. b).

2. Mounting

1) Pushing the S soft brake 7 toward the arrow Ⓑ, mount thesupply reel table assembly 3.
2) Route the string 2 under the TG-1 arm asembly 6, andinsert the tab ⓑ of TG-1 arm assembly into the LS chassis hole ⓒ, then turn the TG-1 arm assembly in the reverse direction of arow Ⓐ (Fig. b).
3) Wind the string 2 along the groove of supply reel tab assembly 3 (Fig. a).

Note : Do not curl the string extremely. Also, avoid adhesion oil, otherwise the image will be distorted.

4) Using the FWD B.T. adjusting driver (Ref. No. J-15), sh the string block 4 toward the arrow Ⓒ and tighten t screw 1 (Fig. a).
5) Engage the tension coil spring 5 to the chassis hook.

Note : Confirm that the string 2 is surely wound around the groove of supply reel table assembly 3 (Fig.a).

6) Referring to 3-8, mount the guide base S assembly.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly

Note : At this time, confirm that the T soft assembly is sur engaged with the T soft arm. (Refer to 3-5 Take-up R Table Assembly and Take-up Soft Assembly.)

10) Referring to 1-1, mount the cassette compartment assembl

Note : Referring to 3-22, adjust the tension regulator position

Note : Referring to 3-23, adjust the forward back tension.

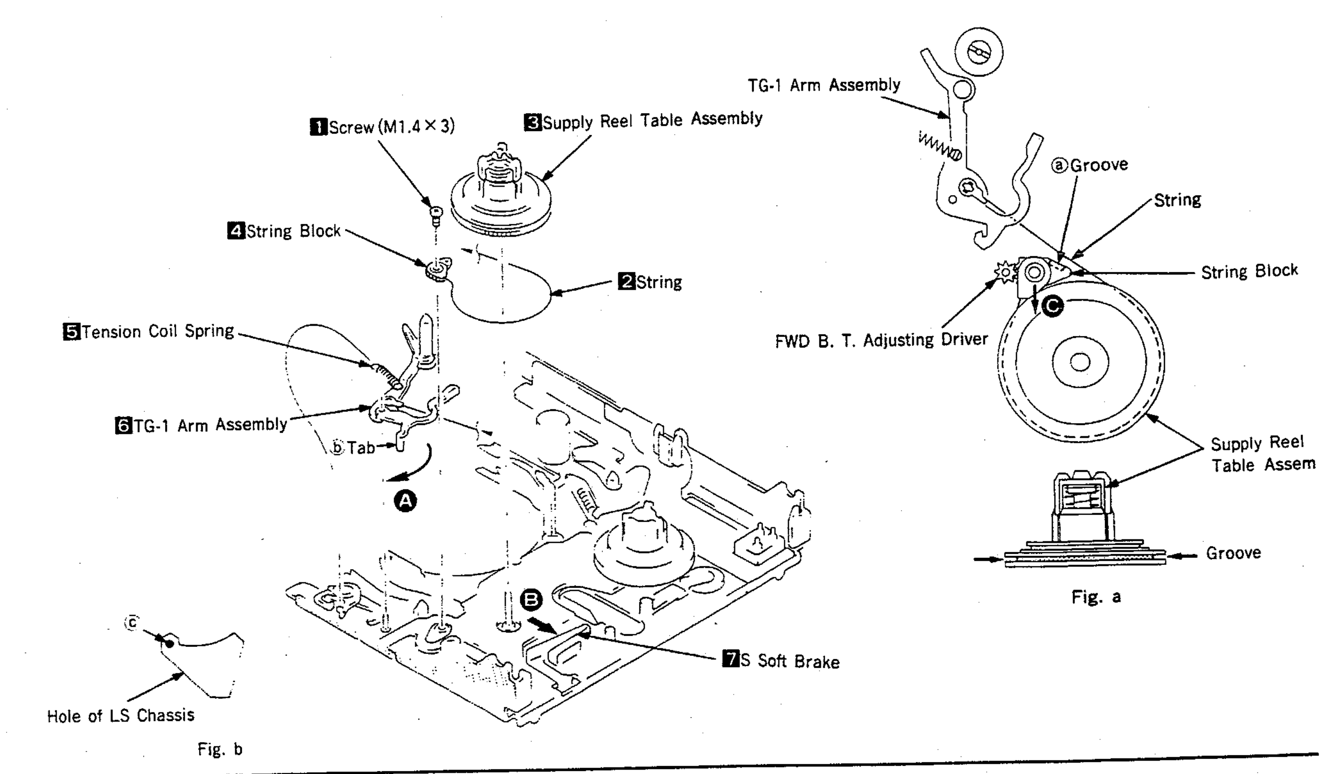

1 Screw (M1.4 × 3)
3 Supply Reel Table Assembly
4 String Block
2 String
5 Tension Coil Spring
6 TG-1 Arm Assembly
ⓑ Tab
Ⓐ
Ⓑ
7 S Soft Brake
ⓒ
Hole of LS Chassis
TG-1 Arm Assembly
ⓐ Groove
String
String Block
Ⓒ
FWD B. T. Adjusting Driver
Supply Reel Table Assem
Groove

Fig. b

Fig. a

Fig. 18

3-11. TG-2 ROLLER ASSEMBLY (Fig. 19)

1. Removal

1) Remove the TG-2 roller assembly **1** .
2) Remove a compression coil spring **2** .

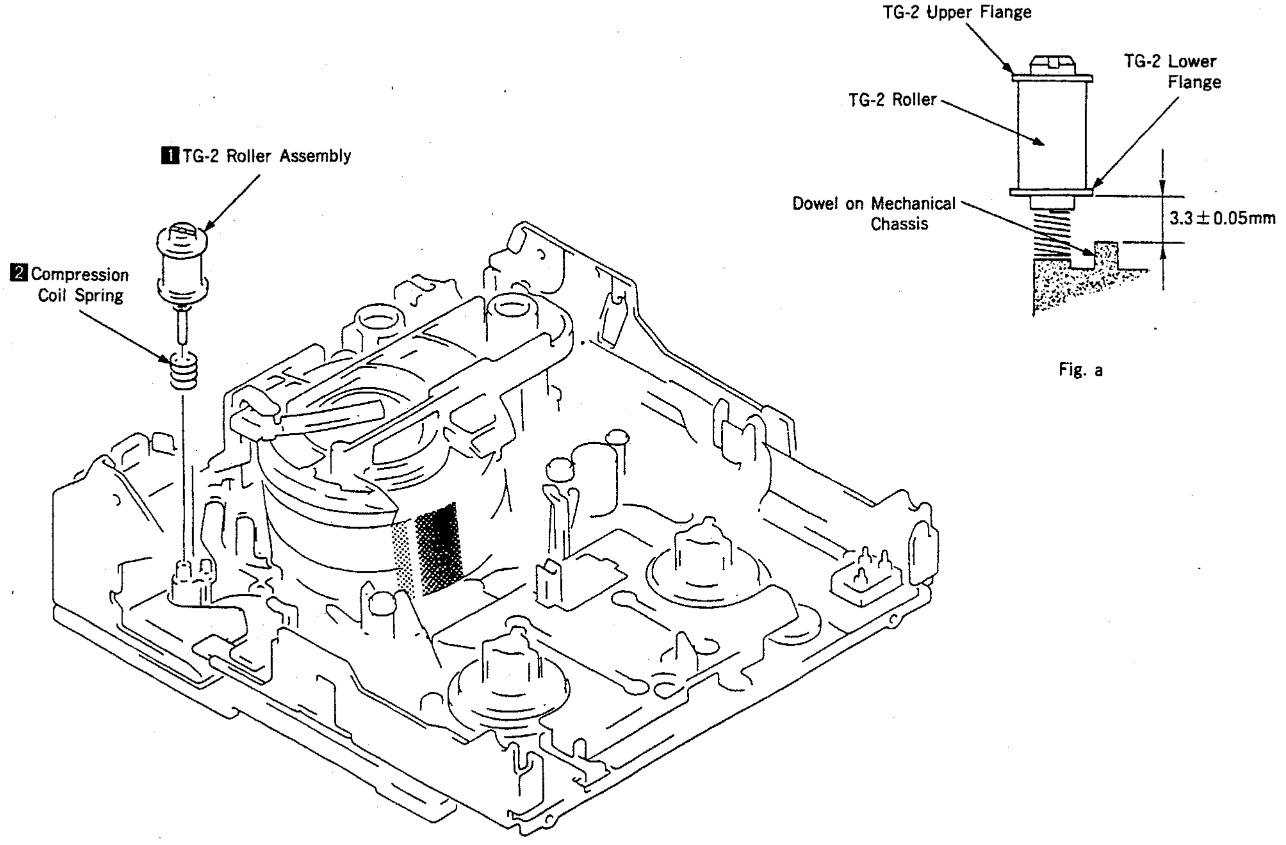
2.Mounting

1) Insert a compression coil spring **2** into the boss on chassis.
2) Rotate gently the TG-2 roller assembly **1** until the screw is engaged.

3. Presetting of TG-2 Roller Height (Fig. a)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3. 3 ± 0. 05mm.

Note : After adjustment, perform 4. TAPE PATH ADJUSTMENT.



1 TG-2 Roller Assembly
2 Compression Coil Spring
TG-2 Upper Flange
TG-2 Lower Flange
TG-2 Roller
Dowel on Mechanical Chassis
3.3±0.05mm
Fig. a

Fig. 19

3-12. TG-7 ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Raise a portion ⓐ of TG-7 arm Leaf spring ❶ in arrow direction with a flat-blade screwdriver or tweezers to disengage the tab from the chassis, then remove the TG-7 arm Leaf spring as shown in Fig. a.
6) Remove the TG-7 assembly ❷ from the shaft of mechanicalchassis.

2. Mounting

1) Mount the TG-7 arm assembly ❷ to the shaft of mechanical chassis.
2) Mount the TG-7 arm Leaf spring ❶ to the mechanicalchassis.
   ***Push in the tab of Leaf spring until it clicks into a deten ofchassis (Fig. a).**
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartmnet assembly.

Note : After mounting, perform 4. TAPE PATH ADJUSTMENT.

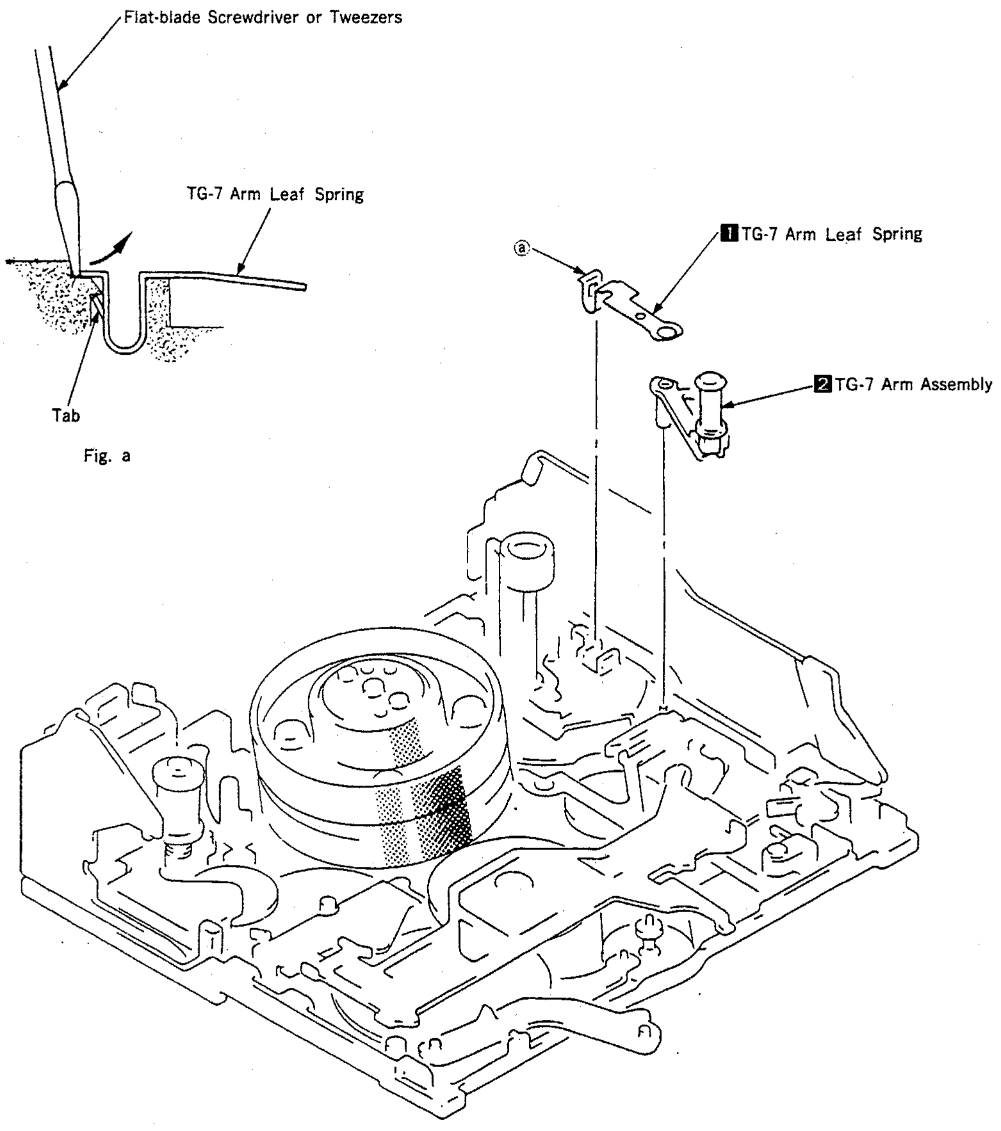


Fig. a

Fig. 20

3-13. LM MOTOR ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Select the $\boxed{\text{LOAD}}$ mode (at the position where the FF arm assembly is not above the screw ❶).
6) Remove two screws ❶, then the LM motor assembly ❷.

2. Mounting

1) Aligning the dowel ⓐ of LM motor assembly ❷ with the hole ⓑ of mechanical chassis, mount the LM motor assembly with its hole ⓒ inserted into the mechanical chassis shaft ⓓ.
2) Tighten two screws ❶.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

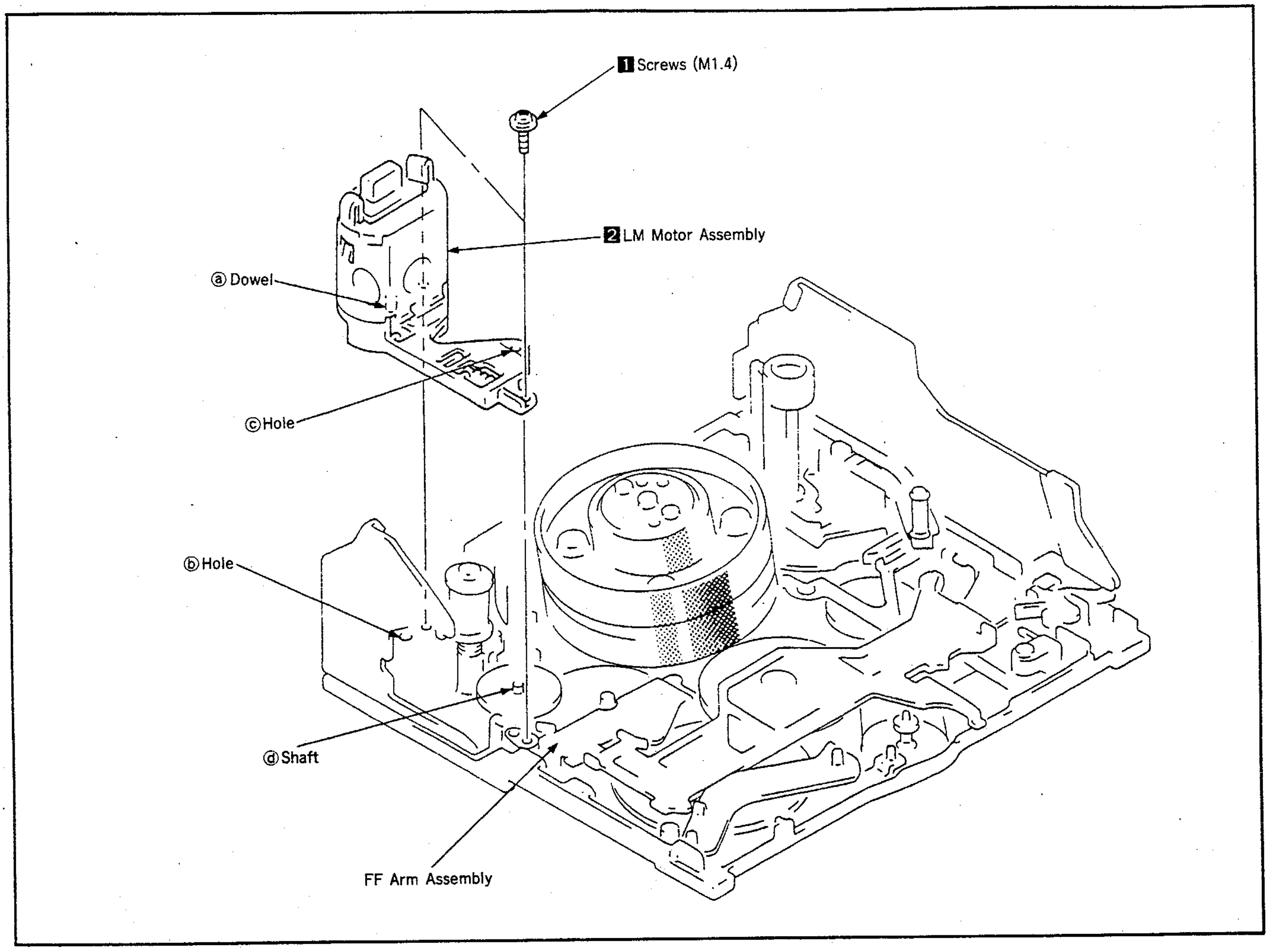


Fig. 21

3-14. LS ARM (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the proctector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove the LS arm ❶ from the shaft of mechanical chassis.

Note : Take care not to drop the LS roller ❷.

2. Mounting

1) Mount the LS arm ❶ meeting with mechanical chassis shaft and cam groove.

Note : Move the LS arm ❶ in arrow direction to confirm that the LS roller ❷ is surely inserted.

2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 3-2, mount the protector base assembly.
4) Referring to 3-1, mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

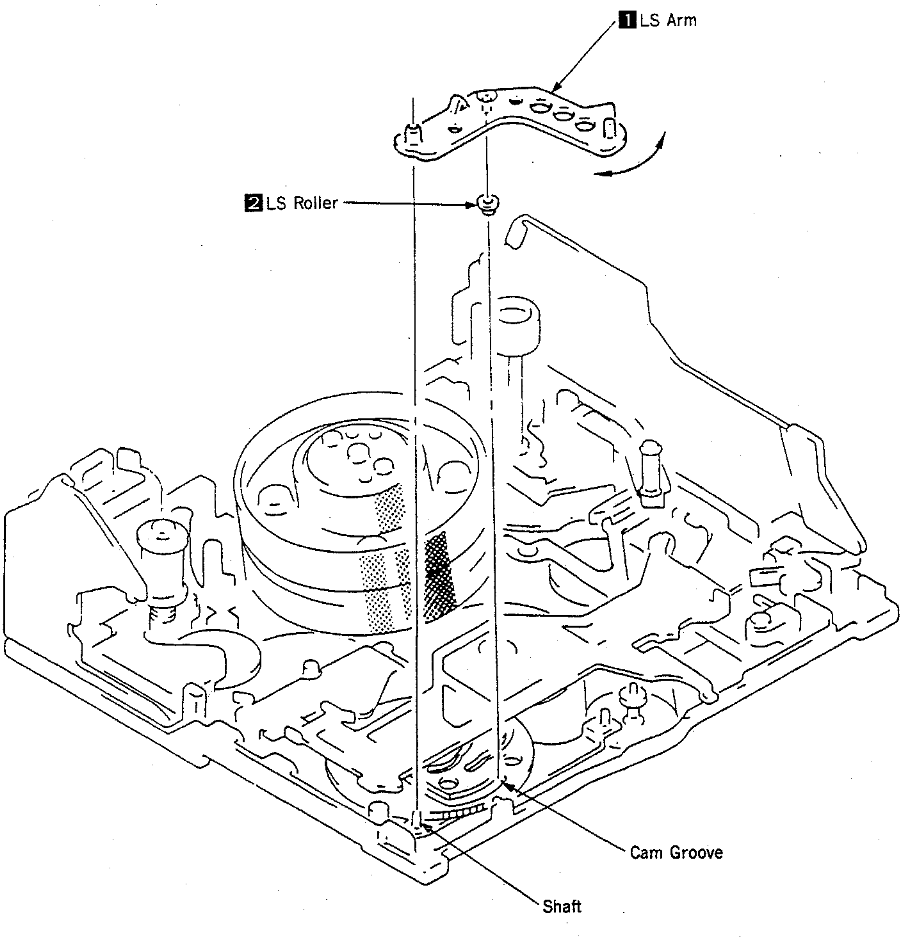


Fig. 22

3-15. M SLIDER ASSEMBLY (Fig. 23)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove two screws ❶, then the gear holder ❷.
6) Remove two lock washers ❸, then the M slider assembly ❹.

2. Mounting

1) Mount the M slider assembly ❹, aligning long holes ⓐ and ⓑ of M slider assembly with shafts ⓒ and ⓓ of mechanical chassis, and a long hole ⓔ with shaft ⓕ of press arm assembly, and also shaft ⓖ with outer groove ⓗ of cam respectively.
2) Mount two lock washers ❸.
3) Mount the gear holder ❷ with its outserts ⓘ and ⓙ inserted into holes in the mechanical chassis.
4) Tighten two screws ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

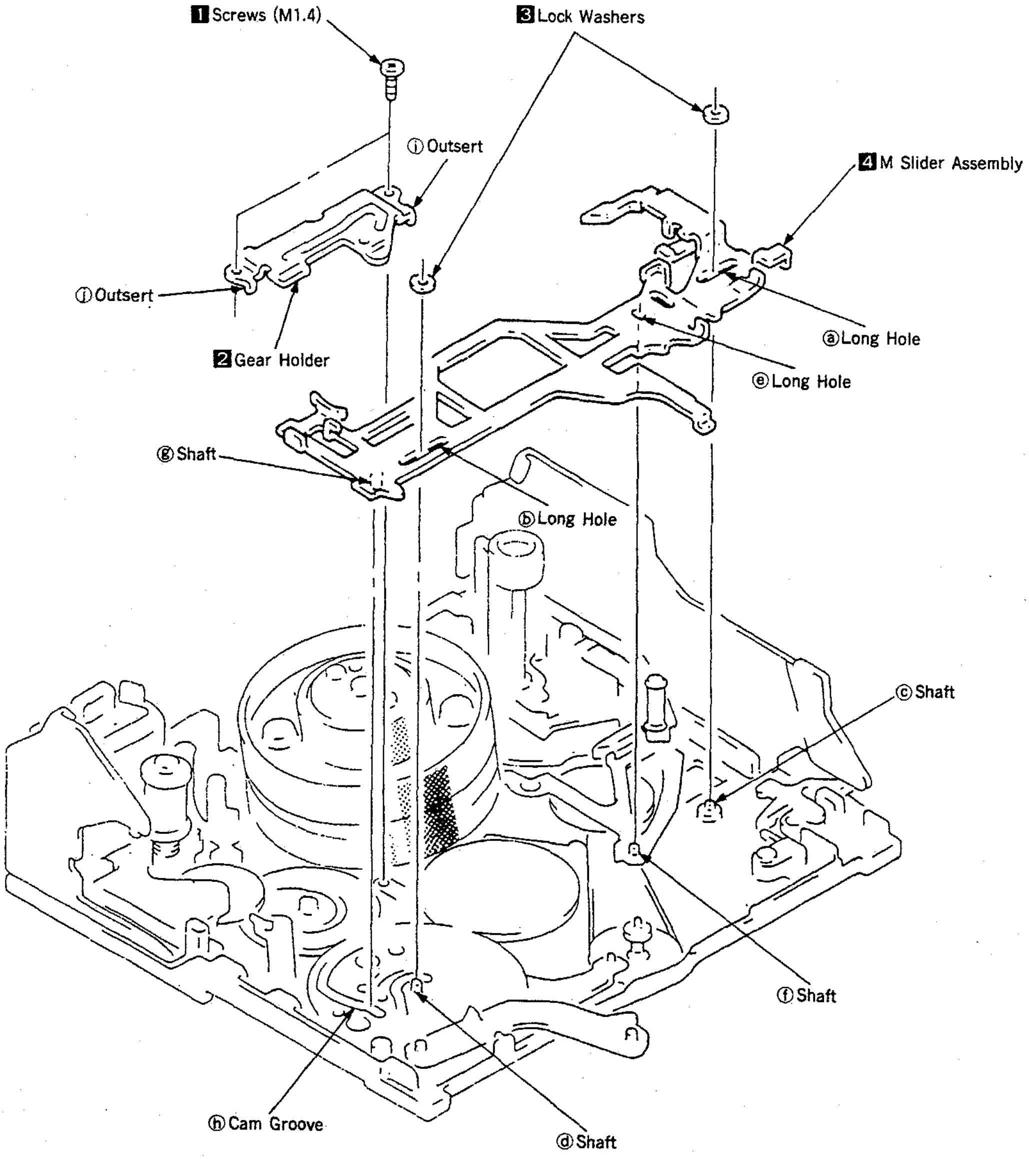

❶ Screws (M1.4)
❸ Lock Washers
ⓘ Outsert
❹ M Slider Assembly
ⓙ Outsert
❷ Gear Holder
ⓐ Long Hole
ⓔ Long Hole
ⓖ Shaft
ⓑ Long Hole
ⓒ Shaft
ⓕ Shaft
ⓗ Cam Groove
ⓓ Shaft

Fig. 23

3-16. PINCH PRESS ARM ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assemvly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove a lock washer ❶, then pinch press arm assembly ❷.

2.Mounting

1) Mount the pinch press arm assembly ❷, inserting its sha ⓐ into the cam groove ⓑ of HC drive arm, and hole ⓒ int the shaft ⓓ of mechanical chassis.
2) Mount the lock washer ❶.
3) After mounting, shift the pinch press arm assembly towar the arrow direction.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-3, mount the drum assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

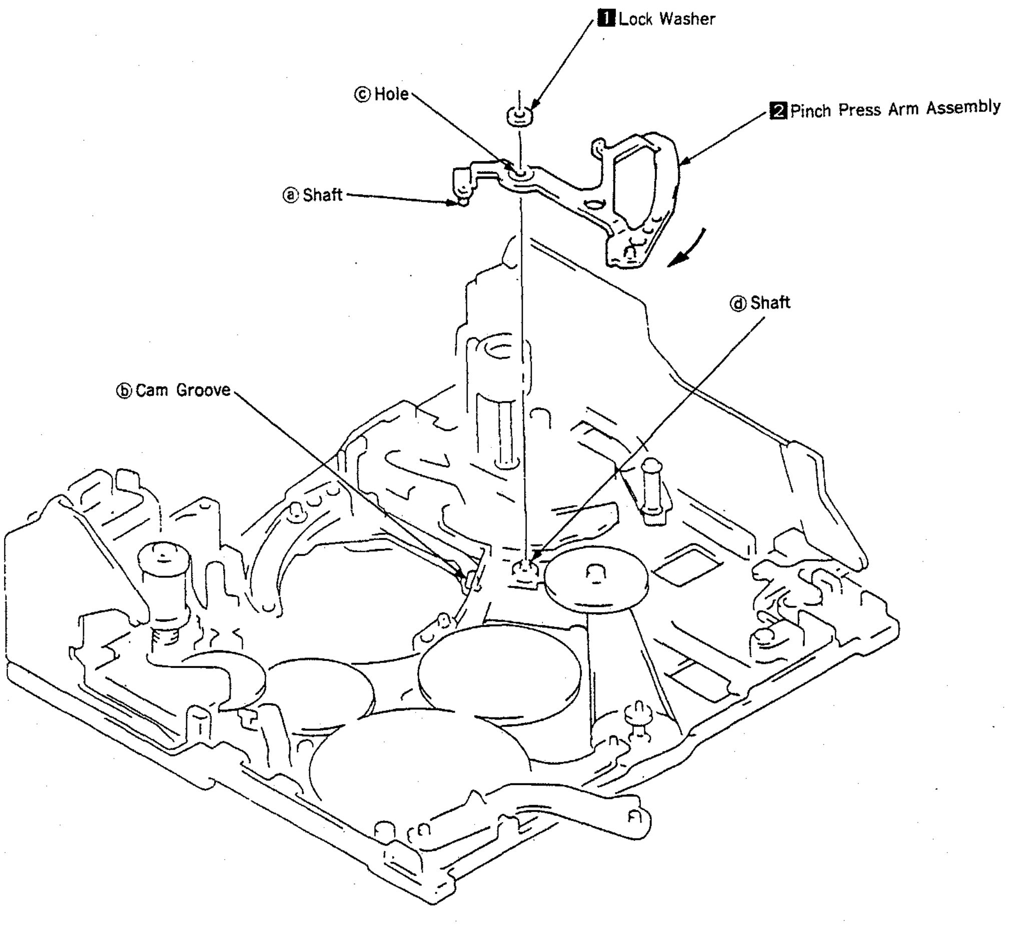


Fig. 24

3-17. CAM (Fig. 25)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove the cam ❶.

2. Mounting

1) Referring to 3-13, remove the LM motor assembly.

Note : Take care not to allow grease of LM motor assembly to stick to the TG-2 roller assembly.

2) Mount the cam ❶, aligning its center hole with shaft of mechanical chassis, and the cam groove with the shaft of GL arm assembly. At this time , make sure that the ▲ mark on L gear B is aligned with that on the cam and also a recess is aligned with the phase aligning hole respectively as shown in Fig. a.

Note : Apply grease to the cam groove if it scarecely remains.

3) Mount the LM motor assembly.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-14, mount the LS arm assembly.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

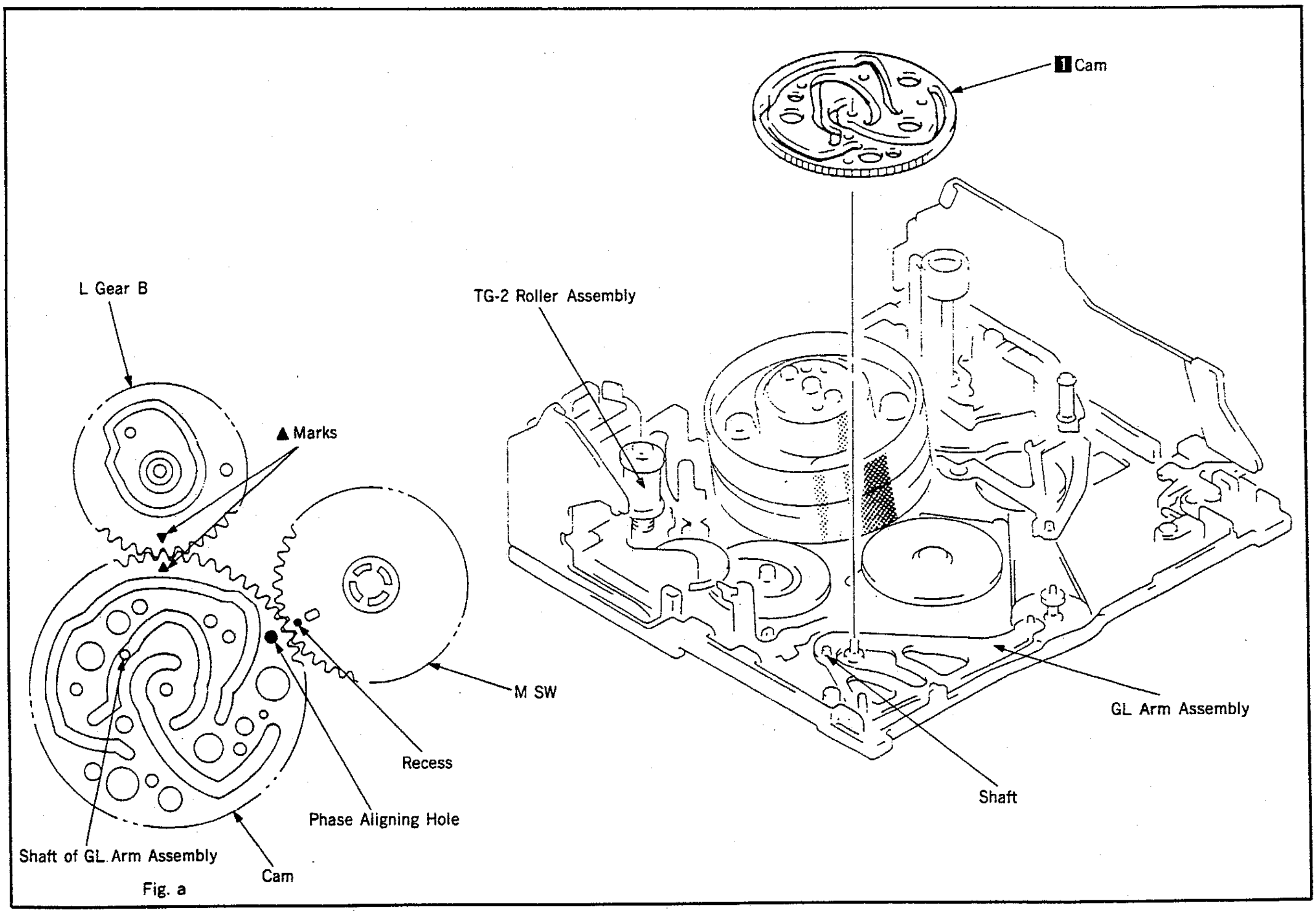


Fig. a

Fig. 25

3-18. GL ARM ASSEMBLY (Fig. 26)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Remove the GL arm assembly **1**.

2. Mounting

1) Mount the GL arm assembly **1** with its hole ⓐ inserted into the shaft ⓑ of mechanical chassis.
2) Referring to 3-17, mount the cam.
3) Referring to 3-15, mount the M slider assembly.
4) Referring to 3-14, mount the LS arm assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

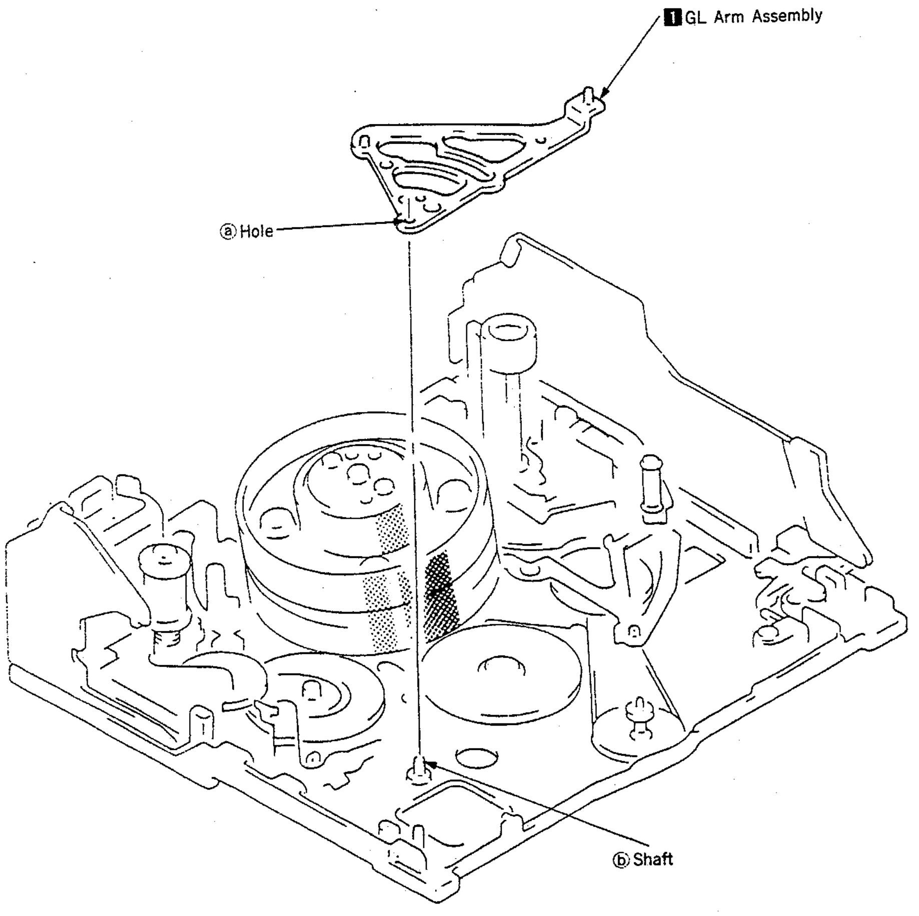


Fig. 26

3-19. L GEAR A AND L GEAR B (Fig. 27)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Referring to 3-13, remove the LM motor assembly.
9) Remove the FF arm assembly ❶.
10) Remove the L gear A ❷.
11) Remove the L gear B ❸.

2. Mounting

1) Insert the L gear B ❸ into the shaft of mechanical chassis. (At this time, the phase aligning mark ▲ should be faced toward the cam mounting shaft ⓐ.)
2) Insert the L gear A ❷ into the shaft of mechanical chassis.
3) Mount the FF arm assembly ❶ with its two shafts inserted into the cam groove of L gear B ❸ and the hole of mechanical chassis.
4) Referring to 3-17, mount the cam.
5) Referring to 3-13, mount the LM motor assembly.
6) Referring to 3-15, mount the M sleder assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-2, mount the protector base assembly.
10) Referring to 3-1, mount the Retainer, Gooseneck assembly.
11) Referring to 1-1, mount the cassette compartment assembly.

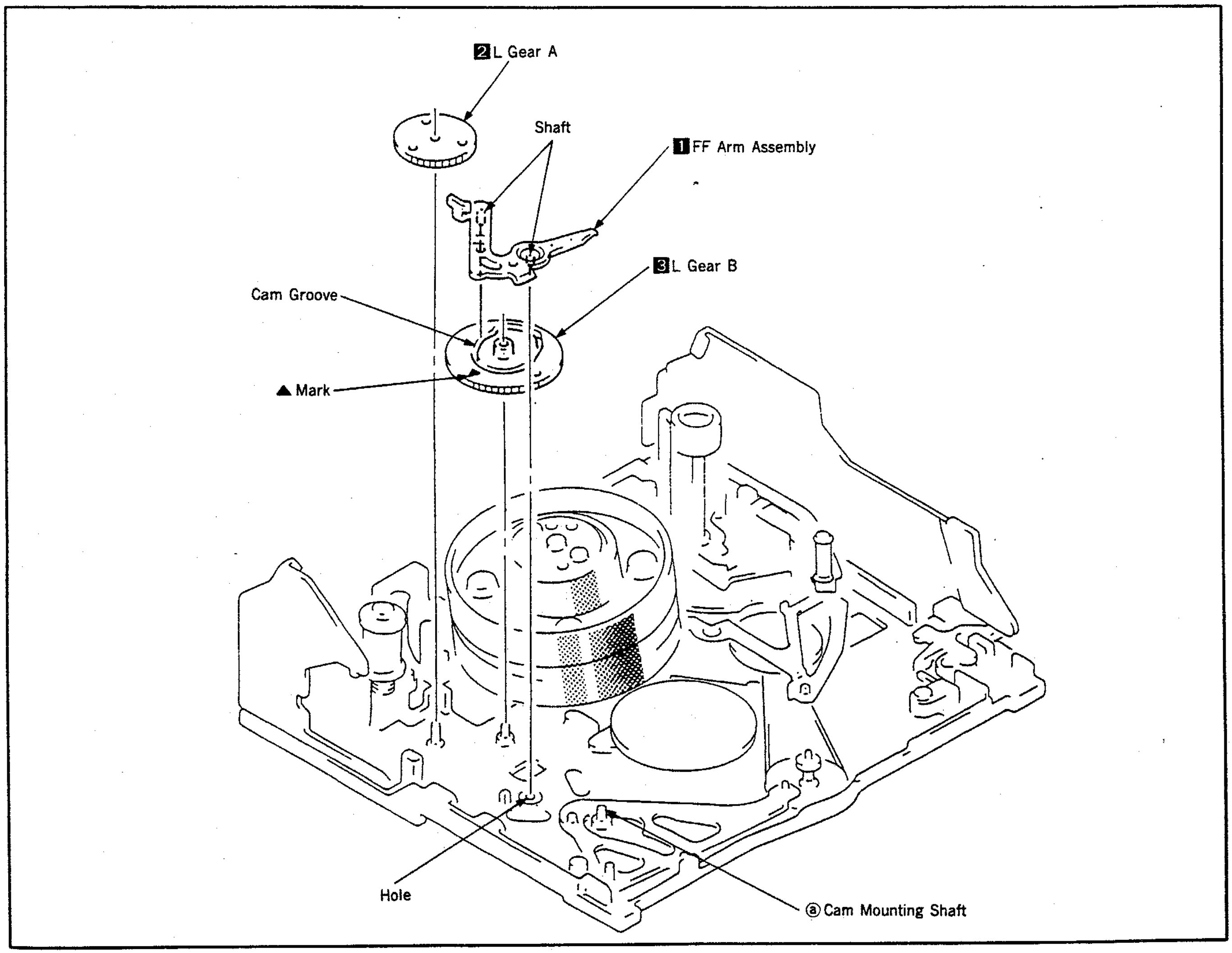


Fig. 27

3-20. RELAY PULLEY AND CHANGE GEAR ASSEMBLY (Fig. 28)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assembly.
6) Referring to 3-14, remove the LS arm assembly.
7) Referring to 3-15, remove the M slider assembly.
8) Referring to 3-17, remove the cam.
9) Referring to 3-18, remove the GL arm assembly.
10) Referring to 3-16, remove the pinch press arm assembly.
11) Remove a lock washer ❶, then remove together the Change gear assembly ❷, relay belt ❸ and relay pulley ❹.

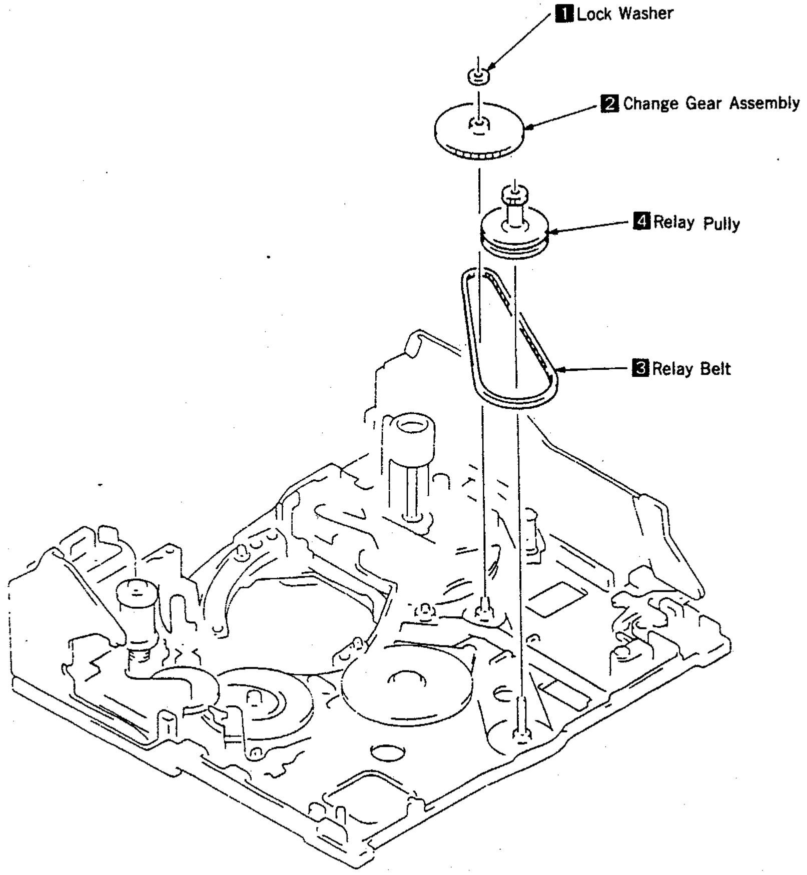
2. Mounting

*Give one or two drips of oil to the conversion gear shaft anc relay pulley shaft respectively. (Oiling range is under th neck as shown in Fig. a.)

1) Hooking the relay belt ❸ to the relay pulley ❹ and Chang gear assembly ❷, mount respective parts.
   *At first, insert the relay pulley into the mechanical chassis shaft, then the change gear assembly by engaging with th capstan motor gear.

Note : Take care not to damage the Change gear by th capstan motor gear.

2) Mount a lock washer ❶.
3) Referring to 3-16, mount the pinch press arm assembly.
4) Referring to 3-18, mount the GL arm asembly.
5) Referring to 3-17, mount the cam.
6) Referring to 3-15, mount the M slider assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-3, mount the drum assembly.
10) Referring to 3-2, mount the protector base assembly.
11) Referring to 3-1, mount the Retainer, Gooseneck assembly
12) Referring to 1-1, mount the cassette compartment assembly



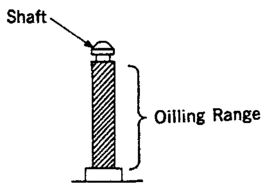


Fig. a

Fig. 28

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

- If possible, make a recording before removal.

1) Remove the two screws 1 (Fig. 29).
2) Mount the jig 2 (Ref. No. J-10) with the two supplied screws 3, then screw the attached hexagon socket screws 4 to the jig 2. The rotary upper drum 5 will move upward and come off (Fig. 30).

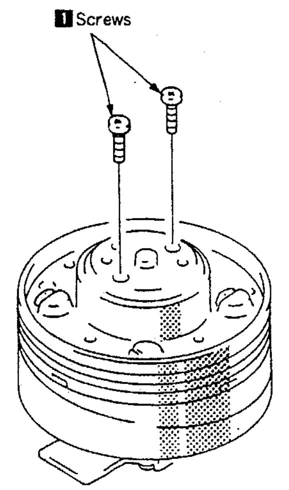


Fig. 29

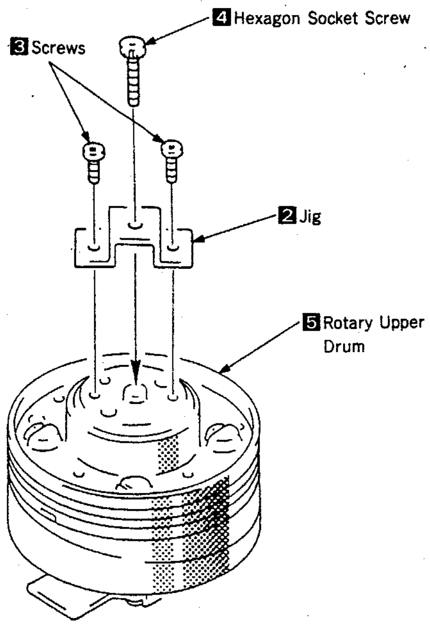


Fig. 30

2. Installation

1) Wipe clean the flange surface and the rotary upper drum 5 surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig 6 (Ref. No. J-10) into the drum positioining hole, then set then set the rotary upper drum 5 by passing the jig through its positioning hole 7. (Fig.31)
3) Remove the jig 6 and push down the rotary upper drum 5 gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws 1 alternately (Fig.29).
4) Insert the jig 6 into the positioning hole 7 again and confirm that it goes in smoothly. If it does not, loosen the two screws 1, repeat step 2) of the Removal paragraph and restart the setting procedure.
5) Tighten the screws 1.

Note : After installing, be sure to perform tape path adjustment as described in section 4.

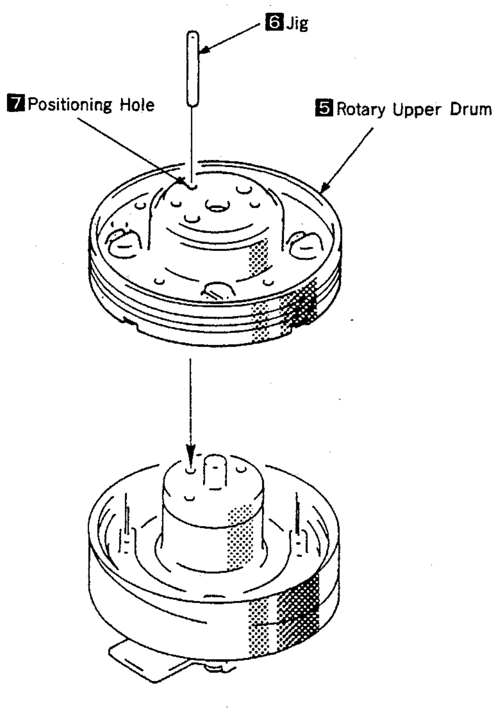


Fig. 31

3-22. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 32)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 4.2 mm.
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw ❶.
5) If No.1 guide is located inside the specified position, shift the string block toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-15). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw ❶.

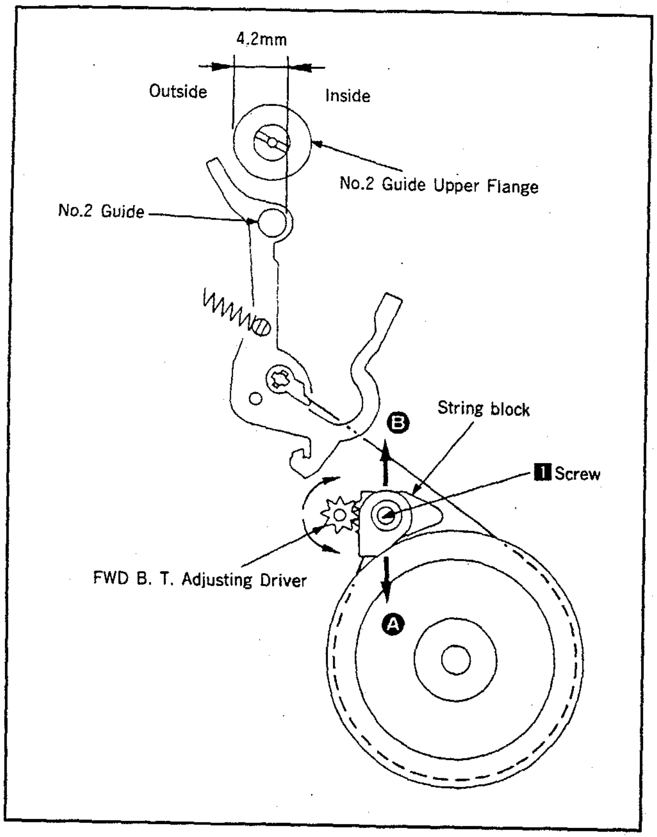

4.2mm
Outside
Inside
No.2 Guide Upper Flange
No.2 Guide
String block
Ⓑ
❶ Screw
FWD B. T. Adjusting Driver
Ⓐ

Fig. 32

3-23. FWD BACK TENSION ADJUSTMENT (Fig.33)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-17).
2) Set the torque cassette (Ref No.J-10).
3) Select the FWD mode, and check that the torque of S reel table is 8.5 ~ 11.5 g · cm.
   If it is out of standard, adjust the TG-1 spring hook position using the FWD B.T. adjusting driver (Ref No. J-15).

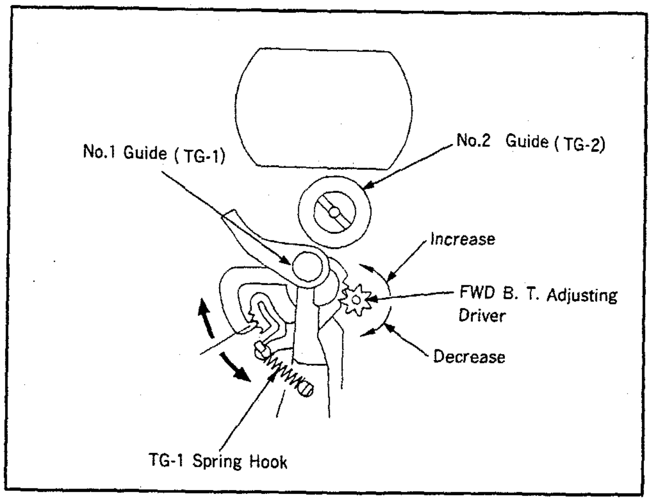

No.1 Guide (TG-1)
No.2 Guide (TG-2)
Increase
FWD B. T. Adjusting Driver
Decrease
TG-1 Spring Hook

Fig. 33

3-24. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuatio center of T reel table is 7 ~ 17 g · cm
3) Select the REV mode, and check that the torque fluctuatio center of S reel table is 25 ~ 39 g · cm.
4) Select the REV mode, and check that the torque of T ree table is 7 ~ 17 g · cm.
5) If the above data is not satisfied, the tension regulator band, hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.

This does away a tracking control knob and allows accurate track tracing.

On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.

Therefore, in the A mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No.J-16). So, fine tracking adjustment can be easily done. Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

Example) For CCD-FX410 series

Set the adjusting remote controller to the HOLD ON side.

1) Set PAGE : 1, ADDRESS : 00, DATA : 01 to cancel the PROTECT mode.
2) Set PAGE : D, ADDRESS : 01, DATA : 03 to select the PATH mode.

Note : Setting of PATH mode = TRACK SHIFT mode

If the adjusting remote controller (Ref No.J-16) is set to HOLD OFF once, then set to HOLD ON again after mode setting, the display of ADDRESS and DATA changes.

3) After adjustment is over, set DATA : 00, and press the PAUSE buttom on the adjusting remote controller (Ref No. J-16).

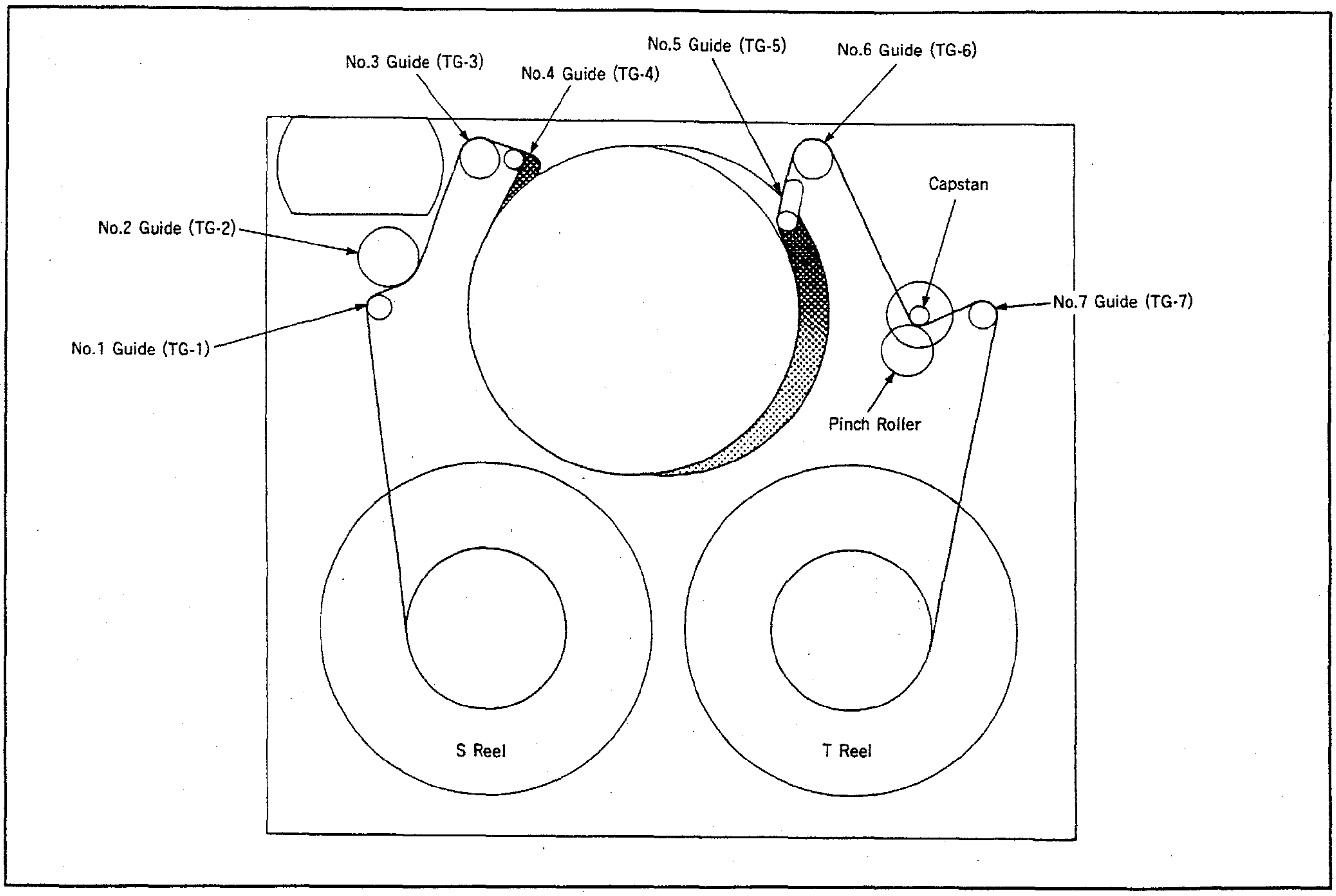


Fig. 34-A

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig.41).

Therefore, when performing section 4-4. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

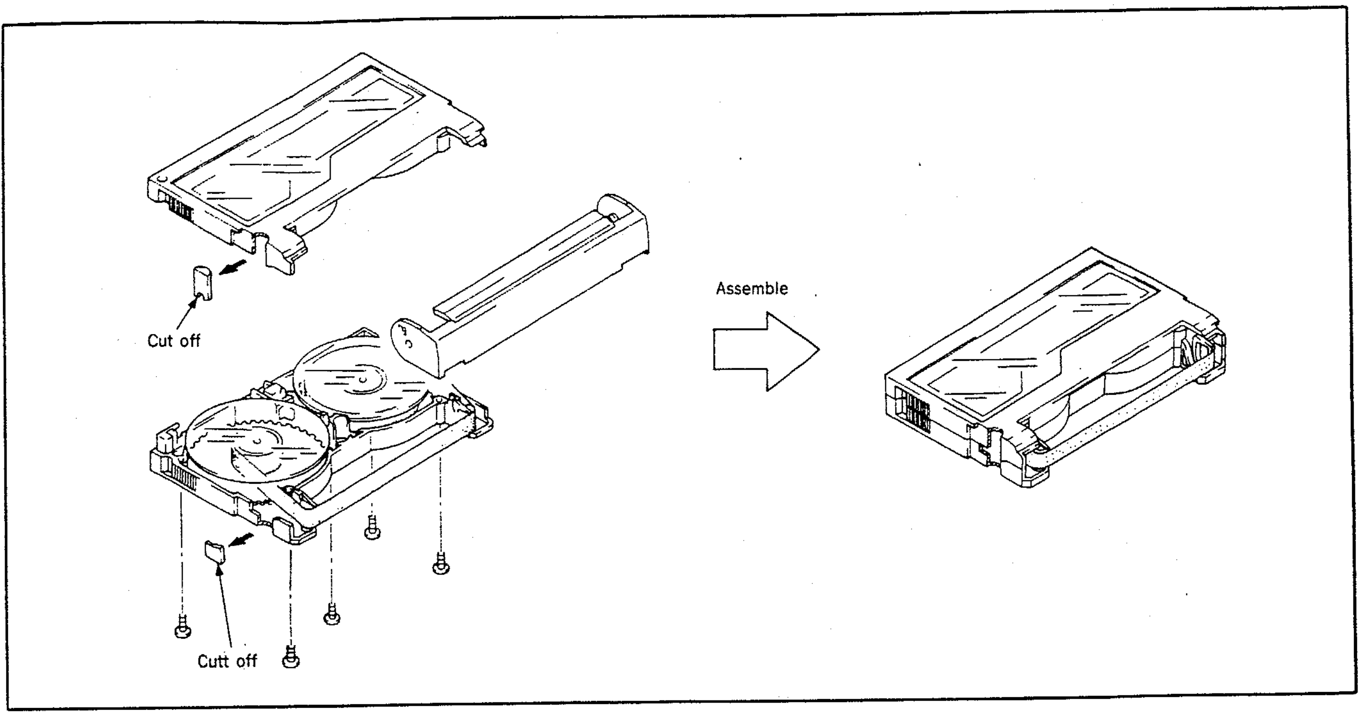


Fig. 34-B

4-1. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34-A).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
   Example) For CCD-FX410 series
   CH1 : CN001 pin ③ (PB RF OUT) on CS-31 board
   CH2 : CN001 pin ④ (RF SWP) on CS-31 board
4) Play back a tracking alignment tape (NTSC : WR5-1N, or PAL : WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 35 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 35 ⓑ and ⓒ.

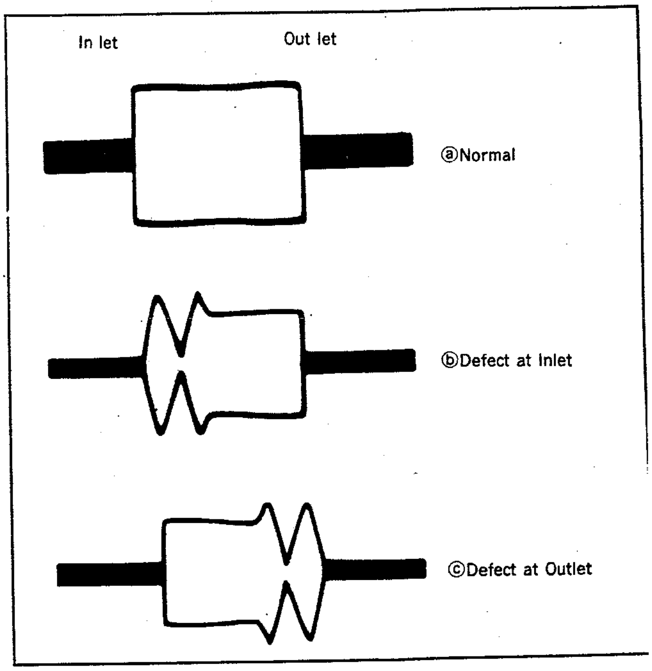


Fig. 35

4-2. TRACKING ADJUSTMENT (Fig. 36, 37)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG-3) lock screw ❶ and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG-3) lock screw ❶ to lock the No.3 guide.
4) Loosen the No.6 guide (TG-6) lock screw ❷ and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG-6) lock screw ❷ to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.

: Take care not to allow interference between No.6 guide and drum when tightening the No.6 guide lock screw.

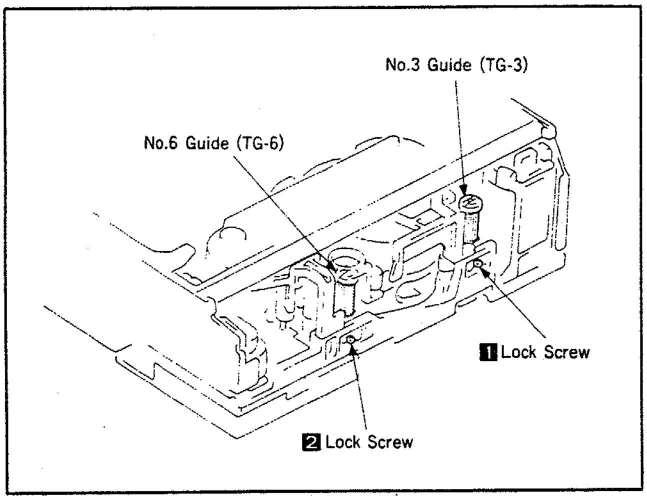


Fig. 36

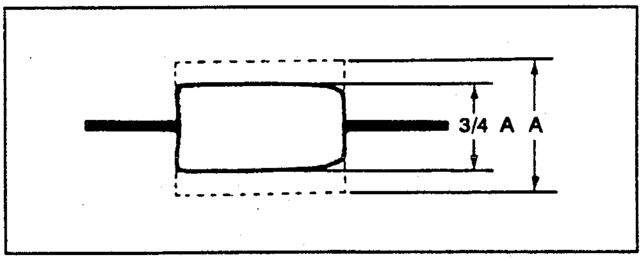


Fig. 37

4-3. No.2 GUIDE (TG-2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

4-3-1. No. 2 GUIDE (TG-2) HEIGHT PRESETTING (Fig. 38)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3.3 ± 0.05 mm.

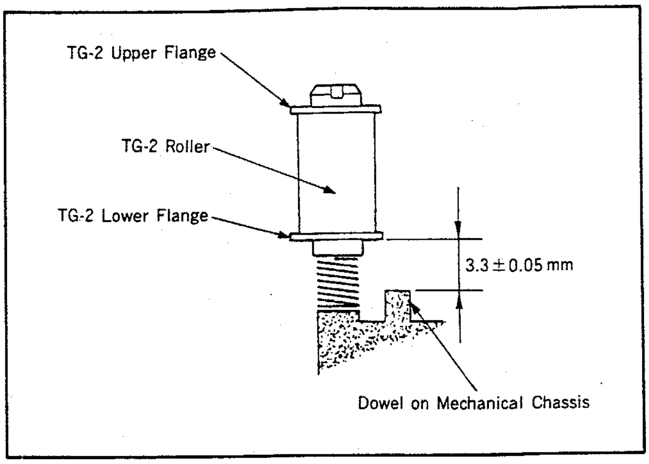


Fig. 38

[Reference]
This A mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-3-2. No. 2 GUIDE (TG-2) ADJUSTMENT (Fig. 39, 40)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ❷ of the No.2 guide (TG-2) ❶ (Fig. 39). If it is, turn the upper flange ❸ of the No.2 guide (TG-2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 4-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 40), turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ 90° counterclockwise and repeat step 5.
   Repeat steps 5) and 6) until a normal waveform is obtained.
   Then, confirm that the tracking waveform has not changed.
   If it has, perform fine adjustment of entrance side tracking and repeat step 5).

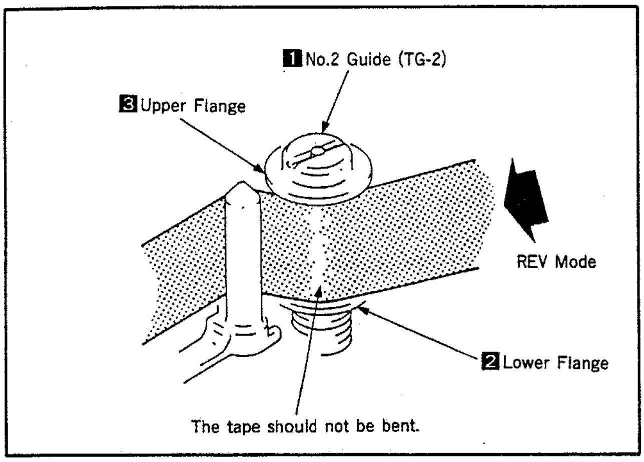


Fig. 39

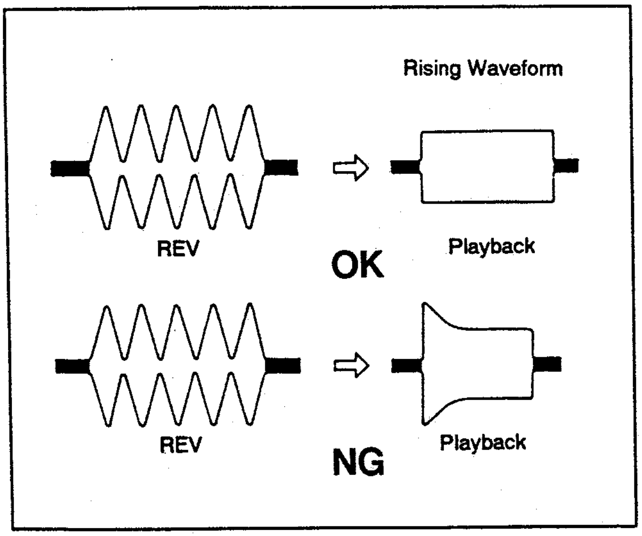


Fig. 40

4-4. No.7 GUIDE (TG-7) ADJUSTMENT (Fig. 41)

Note : This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 34-B).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG-6) ❶ and the capstan ❷. If it is, turn the hight adjusting screw ❹ of the No.7 guide (TG-7) ❸ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ❷ and the hight adjusting screw ❹ of the No.7 guide (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the No.7 guide (TG-7) ❸ until bending is within the specification (0.5mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) ❶ and the capstan ❷ is 0.3mm or less, adjustment can be considered completed.

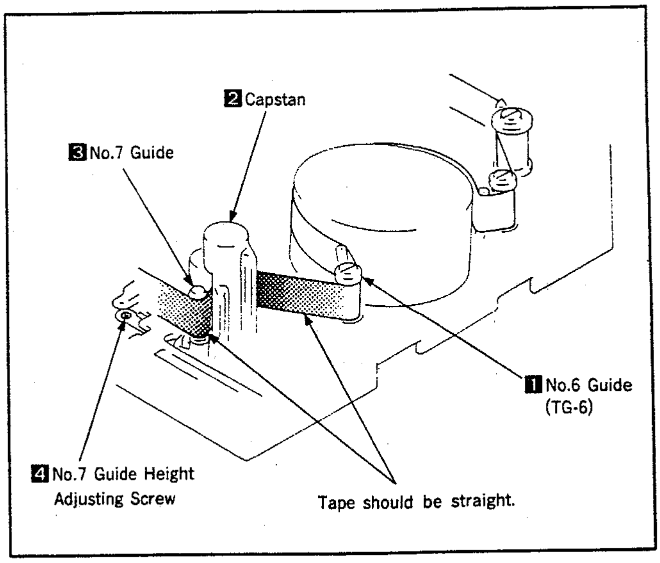


Fig. 41

4-5. CUE AND REV WAVEFORM CHECK (Fig. 42)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 42). In case pitch is not constant, perform section 4-2.Tracking Fine Adjustment and section 4-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig. 42).
   Otherwise, perform section 4-2 Tracking Fine Adjustment.

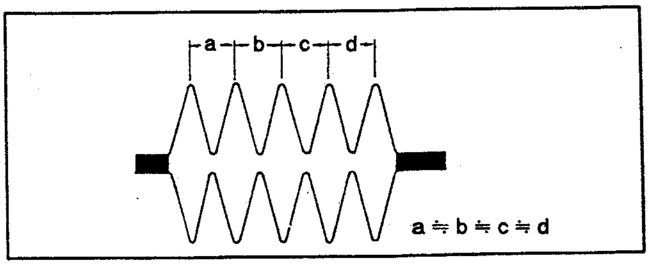


Fig. 42

4-6. CHECK AFTER ADJUSTMENT

4-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 43).
2) Then, confirm that the minimum amplitude value (EMIN) is 65 % of the maximum value (EMAX) or larger (Fig. 44).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

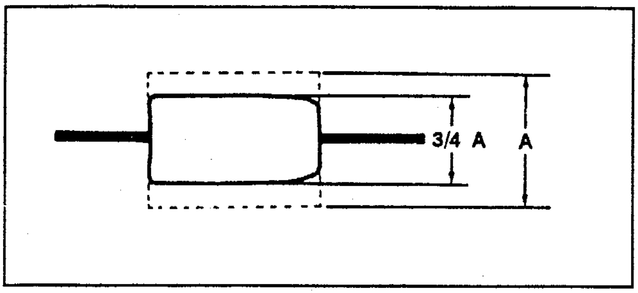


Fig. 43

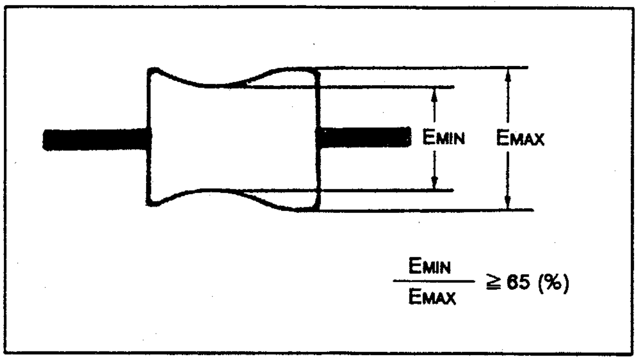


Fig. 44

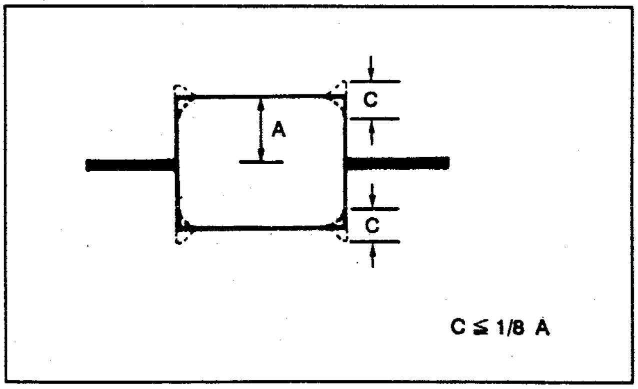


Fig. 45

4-6-2. RISING CHECK (Fig. 46)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

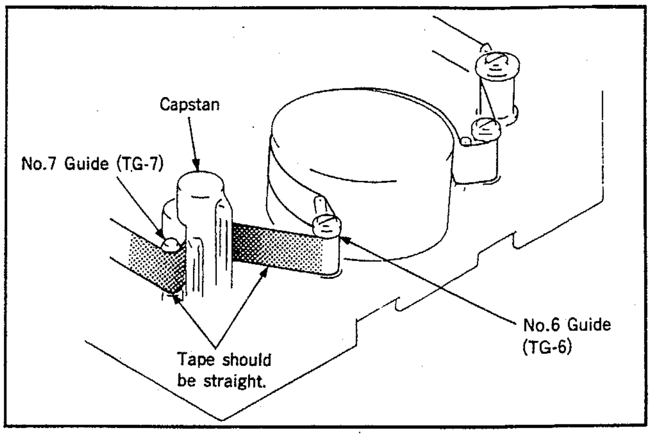

Capstan
No.7 Guide (TG-7)
No.6 Guide (TG-6)
Tape should be straight.

Fig. 46

4-6-3. TAPE PATH CHECK (Fig. 47)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

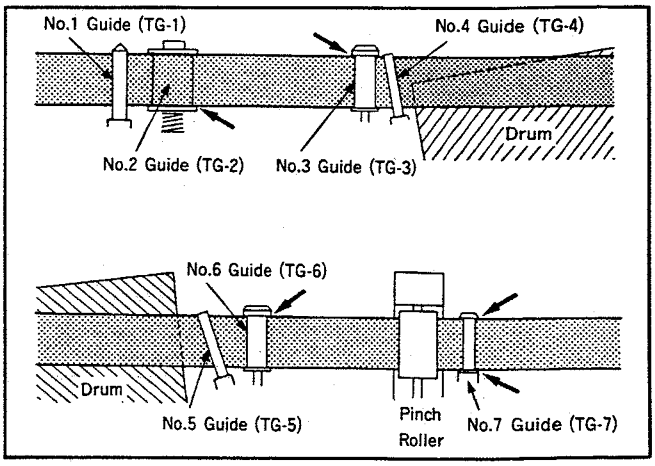

No.1 Guide (TG-1)
No.4 Guide (TG-4)
Drum
No.2 Guide (TG-2)
No.3 Guide (TG-3)
No.6 Guide (TG-6)
Drum
No.5 Guide (TG-5)
Pinch Roller
No.7 Guide (TG-7)

Fig. 47

9-973-199-11

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Personal Video Group

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GV-S50

V19548

SONY

SERVICE MANUAL

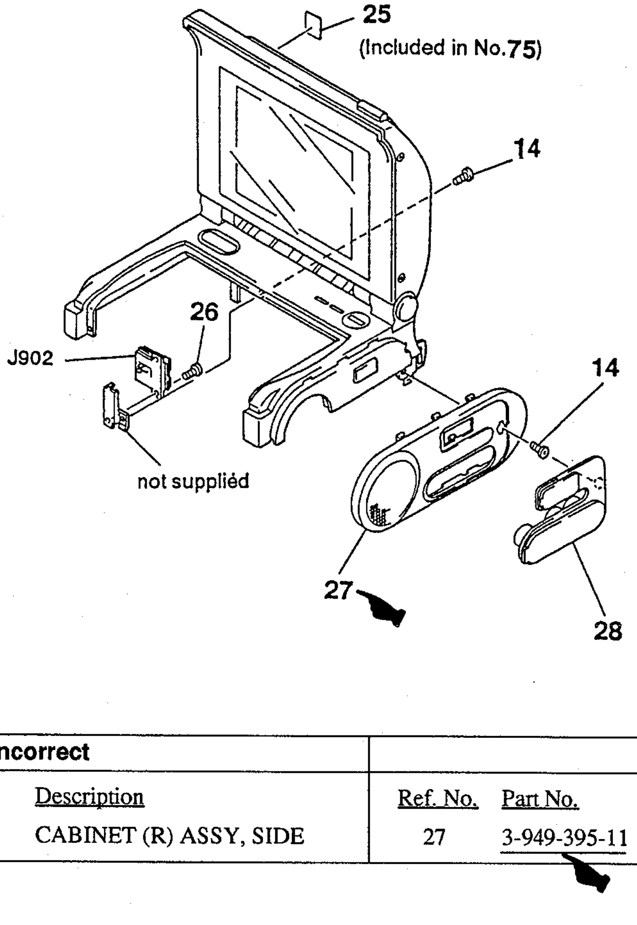
US Model
Canadian Model

CORRECTION-1

Correct your service manual as shown below.

- **Page 134 5-1. CABINET ASSEMBLY for the EXPLODED VIEWS**

☛ : Corrected portion



Incorrect			Correct		
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
27	X-3942-022-1	CABINET (R) ASSY, SIDE	27	3-949-395-11	CABINET (R), SIDE

Sony Corporation
Consumer A&V Products Company
Personal A&V Products Div.

9-973-280-91

English
94J0935-1
Printed in Japan
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Published by Personal A&V Products Div.
Quality Engineering Dept.

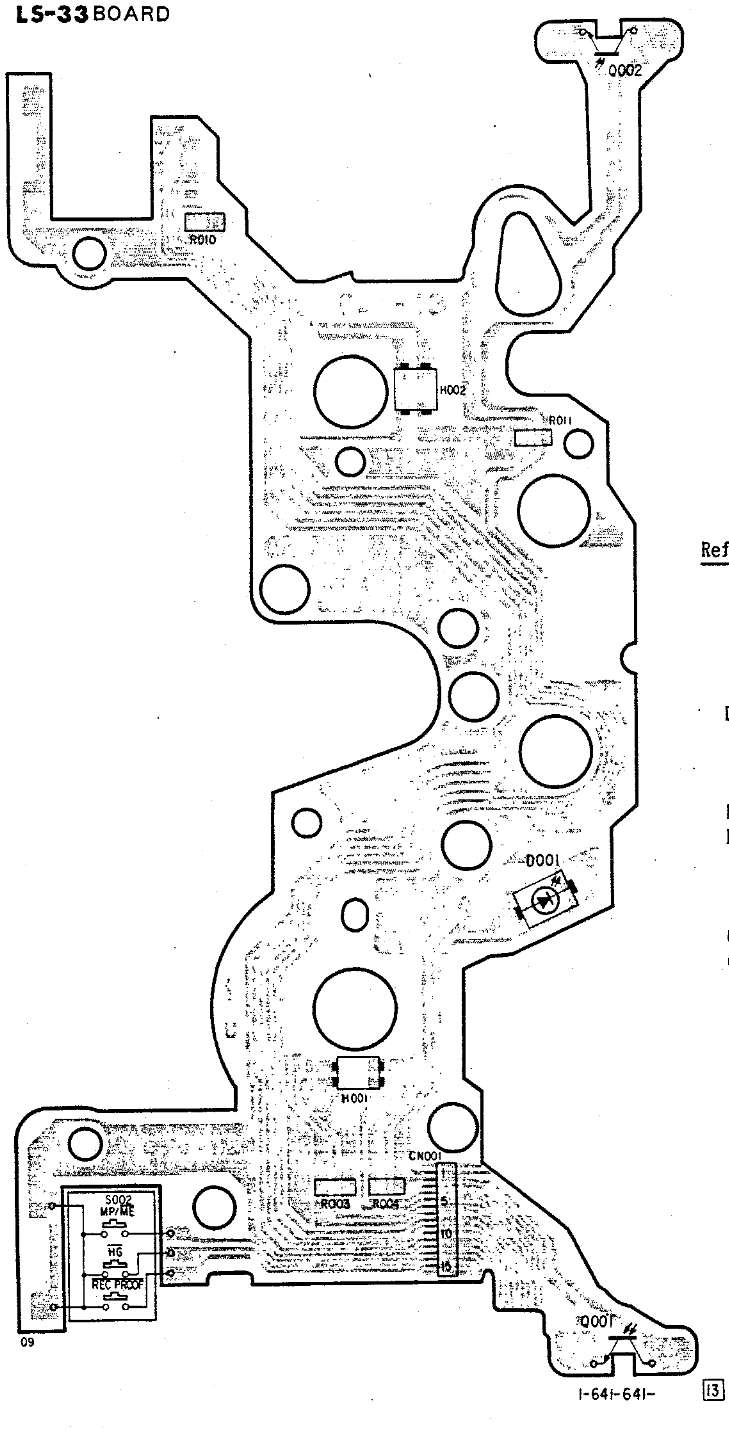
8mm Video MECHANICAL ADJUSTMENT MANUAL IV

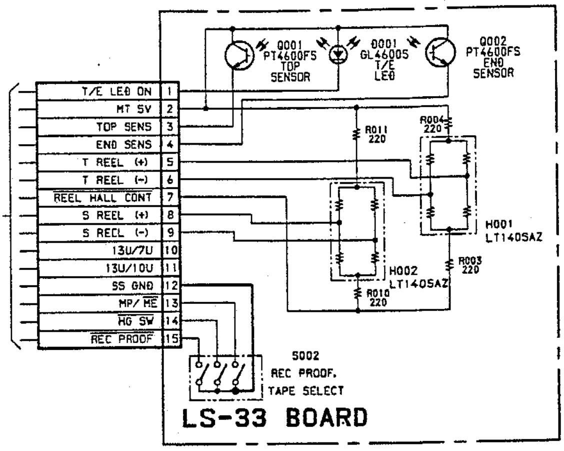
SUPPLEMENT-1

- Guide to LS-33 Board Electrical Parts of the LS Chassis Assembly
- Guide to Changes in Mechanism Parts

(Models)
CCD-FX300/FX310/FX311, CCD-FX400/FX410/FX411, CCD-FX500/FX510/FX511
CCD-FX700/FX710, CCD-FX300E, CCD-FX400E, CCD-FX500E
GV-M20, GV-S50, GV-S50E, CCD-TR31/TR303/TR303PK, CCD-TR303E/TR303EP

LS-33 BOARD

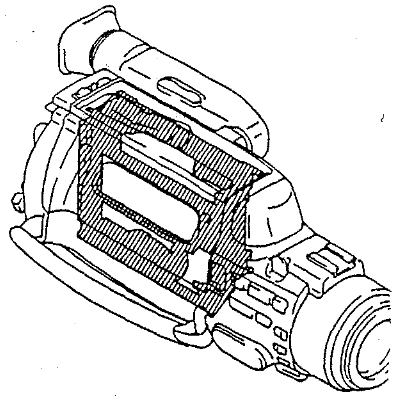

Q002
R010
H002
R011
D001
H001
CN001
1
5
10
15
R003
R004
S002
MP/ME
HG
REC PROOF
09
Q001
1-641-641-
13

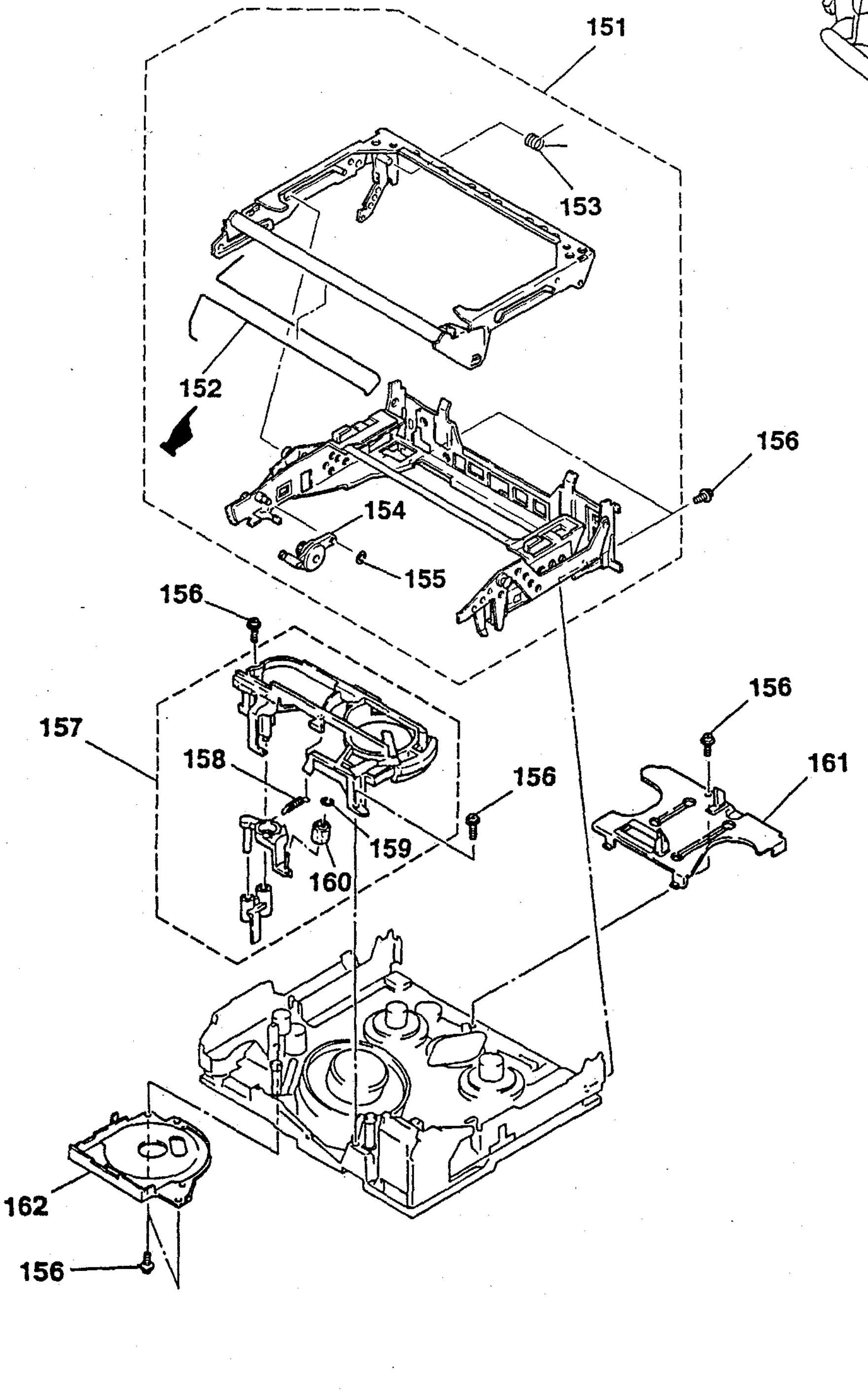

Q001
PT4600FS
TOP
SENSOR
D001
GL4600S
T/E
LED
Q002
PT4600FS
END
SENSOR
T/E LED ON
MT 5V
TOP SENS
END SENS
T REEL (+)
T REEL (-)
REEL HALL CONT
S REEL (+)
S REEL (-)
13V/7V
13V/10V
SS GND
MP/ ME
HG SW
REC PROOF
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
R011
220
R004
220
H001
LT140SAZ
R003
220
H002
LT140SAZ
R010
220
S002
REC PROOF.
TAPE SELECT
LS-33 BOARD

Ref. No.	Part No.	Description	Remark
		LS-33 BOARD, COMPLETE **********************	
		< DIODE >	
D001	8-719-989-52	DIODE GL4600S	
		< DIODE >	
H001	8-719-987-62	DIODE LT140SAZ	
H002	8-719-987-62	DIODE LT140SAZ	
		< TRANSISTOR >	
Q001	8-729-012-46	TRANSISTOR PT4600FS	
Q002	8-729-012-46	TRANSISTOR PT4600FS	
		< RESISTOR >	
R003	1-216-033-00	METAL CHIP 220 5% 1/10W	
R004	1-216-033-00	METAL CHIP 220 5% 1/10W	
R010	1-216-033-00	METAL CHIP 220 5% 1/10W	
R011	1-216-033-00	METAL CHIP 220 5% 1/10W	
		< SWITCH >	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, TAPE SELECT)	

5-4. CASSETTE COMPARTMENT ASSEMBLY

☛ : Changed Portion

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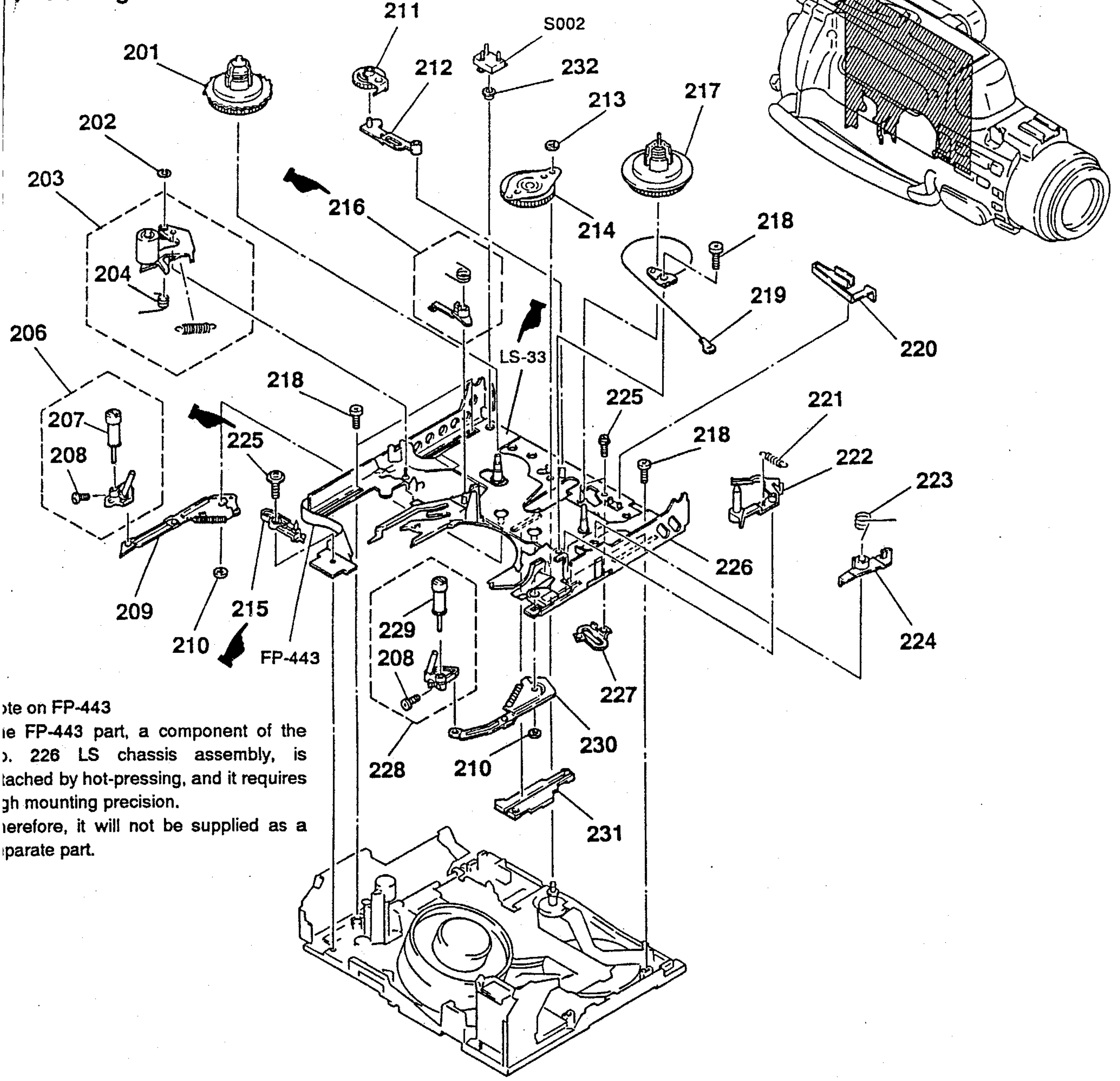
Ref. No.	Part No.	Description	Remark
151	A-7040-312-H	CASSETTE COMPARTMENT BLOCKASSY	
152	3-945-773-01	BAR, TORSION	
153	3-945-771-01	SPRING, TORSION	
154	X-3941-287-2	DAMPER ASSY	
155	3-315-384-31	WASHER, STOPPER	
156	3-947-503-01	SCREW (M1.4X2.5)	

Ref. No.	Part No.	Description
157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY
158	3-945-760-01	SPRING, TENSION
159	3-321-393-01	WASHER, STOPPER
160	X-3166-813-1	ROLLER ASSY, HC
161	X-3941-280-1	RETAINER ASSY, GOOSENECK
162	3-945-733-01	COVER, CAPSTAN

-5. LS CHASSIS ASSEMBLY

☛ : Changed Portion



211
S002
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232
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LS-33
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225
218
222
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226
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215
229
224
210
FP-443
208
227
228
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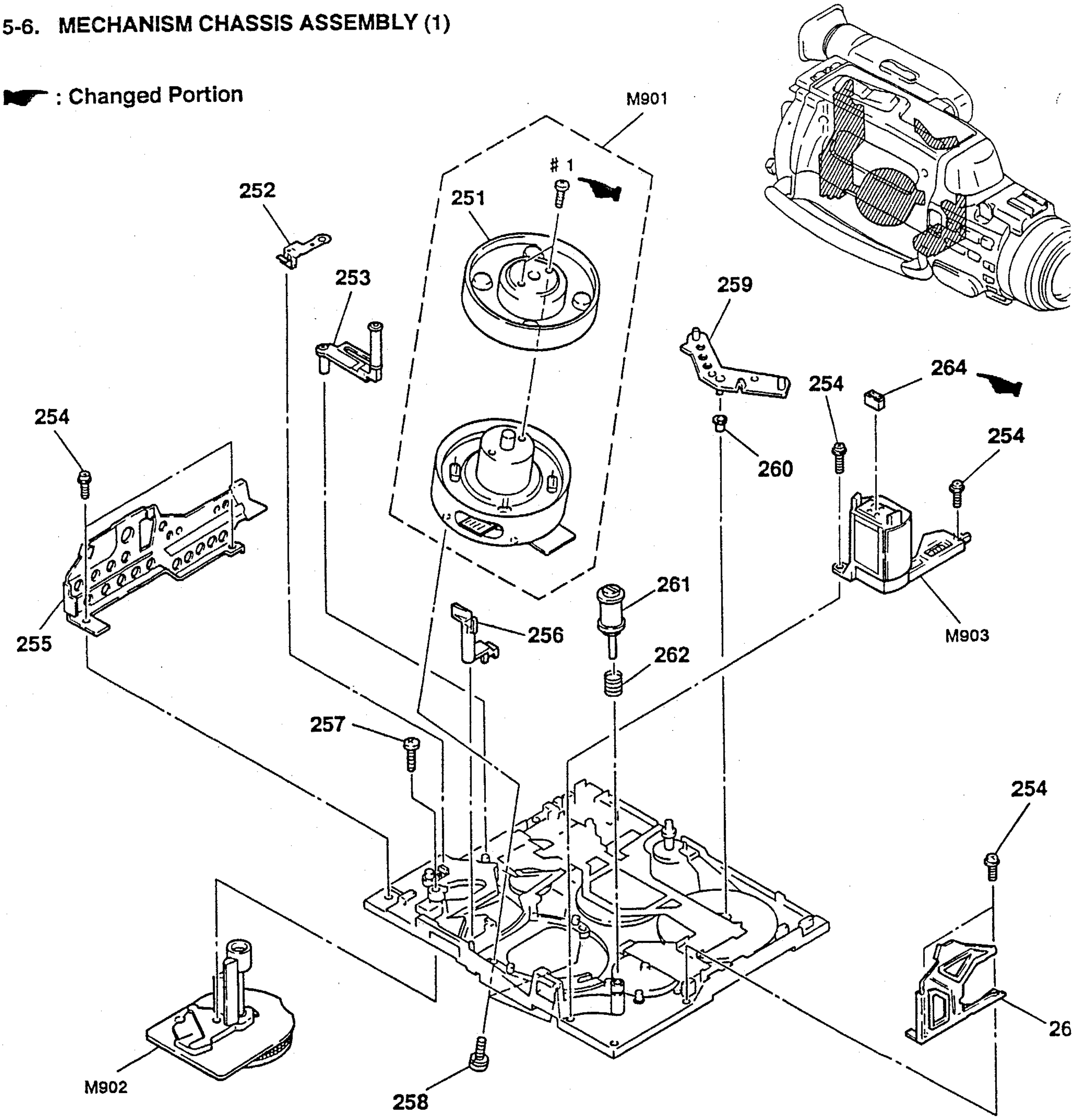
231

te on FP-443
e FP-443 part, a component of the
. 226 LS chassis assembly, is
tached by hot-pressing, and it requires
gh mounting precision.
erefore, it will not be supplied as a
parate part.

.No.	Part No.	Description	Remark
01	X-3941-274-1	TABLE ASSY, REEL, T	
02	3-331-007-21	WASHER	
03	X-3941-271-5	ARM ASSY, PINCH	
04	3-945-743-01	SPRING, TORSION	
06	A-7040-307-A	GUIDE (BASE) (T) BLOCK ASSY	
07	X-3941-424-1	ROLLER ASSY, TG6	
08	3-947-504-01	SCREW (M1.2X2)	
09	X-3941-267-1	ARM (T) ASSY, GUIDE	
10	3-669-465-00	WASHER (1.5), STOPPER	
11	X-3941-273-1	SOFT ASSY, T	
12	3-945-753-01	ARM, T SOFT	
13	3-726-829-01	WASHER, STOPPER	
14	X-3941-279-5	GEAR ASSY, GOOSENECK	
15	3-947-644-01	RETAINER, TG5 (BASE)	☛
16	A-7040-321-A	CLAW BLOCK ASSY, T HARD	☛
17	X-3941-275-6	TABLE ASSY, REEL, S	
18	3-945-756-01	SCREW (M1.4X3)	
219	X-3941-277-1	STRING BLOCK ASSY	
220	3-945-801-01	BRAKE, S SOFT	
221	3-948-810-01	SPRING, TENSION	
222	X-3941-276-1	TG1 ASSY	
223	3-945-752-01	SPRING, TORSION	
224	3-945-799-01	BRAKE, S HARD	
225	3-947-503-01	SCREW (M1.4X2.5)	
226	X-3941-265-1	CHASSIS ASSY, LS	
227	3-945-784-01	PLATE, CAM, LS	
228	A-7040-306-A	GUIDE (BASE) (S) BLOCK ASSY	
229	X-3941-269-1	ROLLER ASSY, TG3	
230	X-3941-266-1	ARM (S) ASSY, GUIDE	
231	3-945-837-01	SLIDER, GL	
232	3-949-881-01	SLEEVE	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	

5-6. MECHANISM CHASSIS ASSEMBLY (1)

☛ : Changed Portion



※ The mark differs according to the model.

Ref. No.	Part No.	Description	Remark
251	※	DRUM ASSY, UPPER ※	
252	3-945-822-01	SPRING, LEAF, TG7 ARM	
253	A-7040-305-A	ARM BLOCK ASSY, TG7	
254	3-947-503-01	SCREW (M1.4X2.5)	
255	X-3941-255-1	PLATE (T) ASSY, SIDE	
256	3-945-735-01	ARM, HC CONVERSION	
257	3-713-786-71	SCREW (M2X5)	
258	3-686-493-01	SCREW (M2X5), P1	
259	3-945-701-01	ARM, LS	

Ref. No.	Part No.	Description	
260	3-945-702-01	ROLLER, LS	
261	X-3941-262-1	ROLLER ASSY, TG2	
262	3-945-774-01	SPRING, COMPRESSION	☛
263	3-945-691-01	PLATE (S), SIDE	
264	1-568-323-11	CONNECTOR, BOARD TO BOARD 4P	
M901	※	DRUM ASSY ※	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
#1	7-627-853-59	SCREW (+P 2X5) ☛	

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Published by CV Quality Engineering D

8mm Video MECHANICAL ADJUSTMENT MANUAL IV

A MECHANISM

SUPPLIMENT-2

Video 8

<Connection of Mode Selector IV Conversion Connector>

In use of Mode selector IV conversion connector(J-6082-167-A), there are two different connecting methods depending on the model connected:

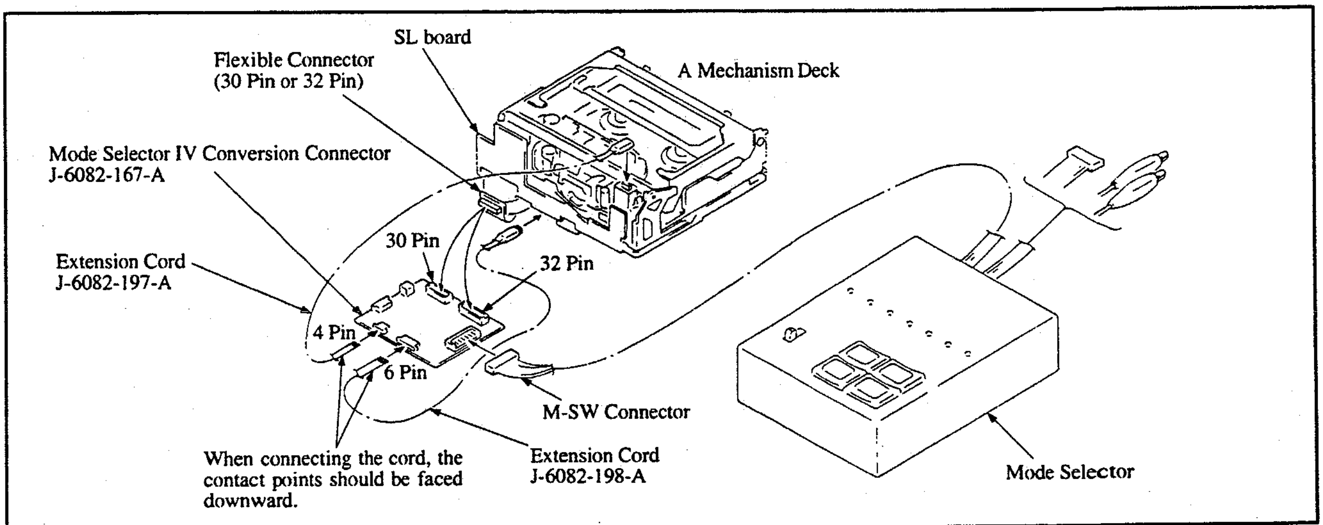
1. CCD-FX series

With the SL board mounted on mechanical deck, connect 30-pin(or 32-pin) connector to 30-pin(or 32-pin) Mode selector IV conversion connector.

(CCD-FX300 series, FX400 series. FX500 series
→ 30-pin connector (FP425 or FP600)
CCD-FX700 series → 32-pin connector (FP477))

2. Models other than above

Connect the extension cord (J-6082-197-A) to loading motor 4-pin connector and extension cord (J-6082-198-A) to mode switch 6-pin connector in mechanical deck, then connect the other end of cord to 4-pin and 6-pin connectors of Mode selector IV conversion connector respectively, as shown below.


SL board
Flexible Connector (30 Pin or 32 Pin)
A Mechanism Deck
Mode Selector IV Conversion Connector J-6082-167-A
30 Pin
32 Pin
Extension Cord J-6082-197-A
4 Pin
6 Pin
M-SW Connector
Extension Cord J-6082-198-A
Mode Selector

When connecting the cord, the contact points should be faced downward.

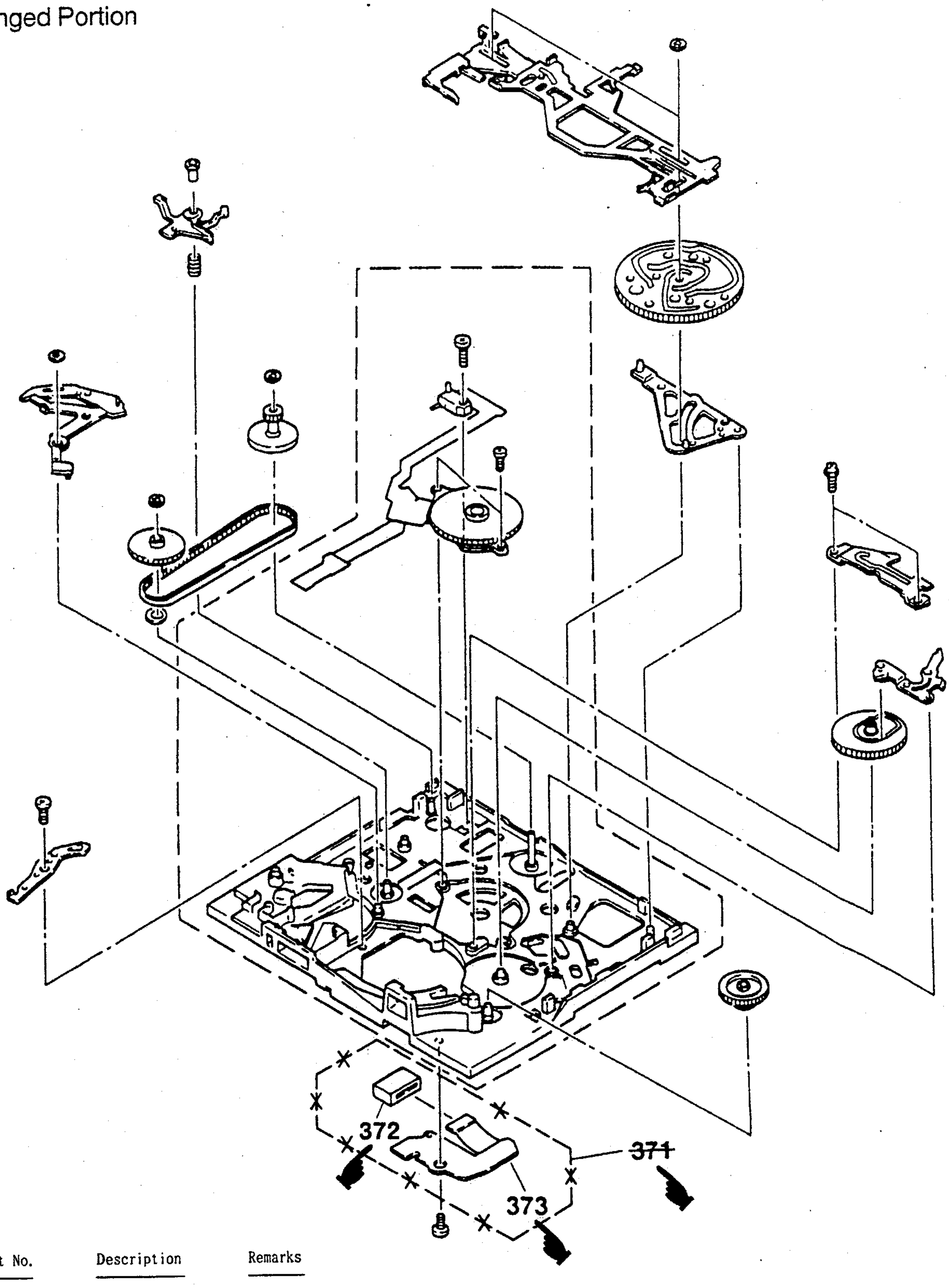
<CORRECTION>

P10. 2-4 Service jigs list

		Incorrect		Correct
J-15	FWD B.T adjusting driver	J-6082-182-A	➡	J-6082-187-A

MECHANISM CHASSIS ASSEMBLY (2)

☛ : Changed Portion



Ref.No.	Part No.	Description	Remarks
~~371~~	~~A-7040-311-A~~	~~FP-444 ASSY~~ ☛	
372	1-691-254-13	CONNECTOR, TRANSLATION 10P ☛	
373	1-641-639-13	FP-442 FLEXIBLE BOARD ☛	

English
93E18163-1
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Sony Corporation
Personal Video Group

9-973-199-84

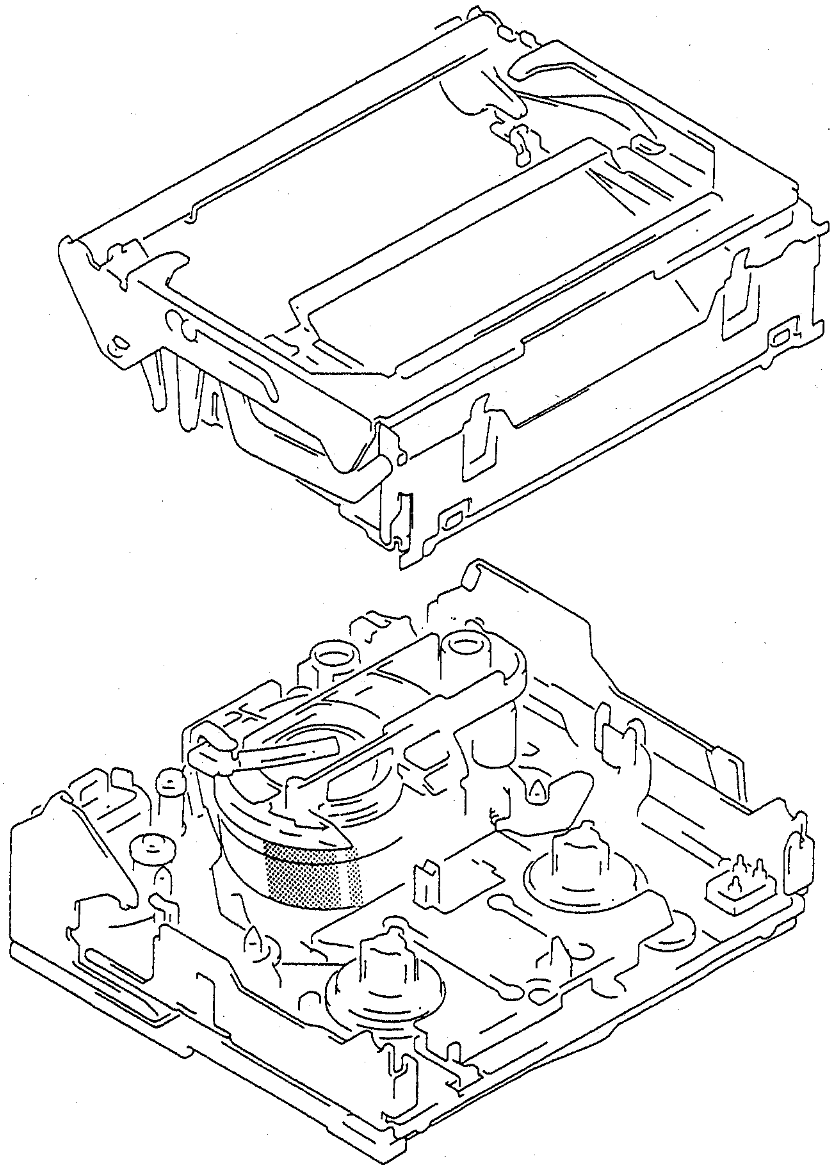
8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ

V12995

A MECHANISM

Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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4-6-3. Tape Path Check ---------- 40

1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-3, Handling of Mode Selector".)

1-1. CASSETTE COMPARTMENT ASSEMBLY

1. Removal (Fig. 1)

1) Select the USE mode.
2) Push the part ⓐ of lock arm ❶ toward the arrow 🅐 to unlock from lock guide ❷, and raise the cassette compartment as shown in Fig. a.
3) Remove two screws ❸ and remove the LS frame ❹ toward the arrow 🅑.
4) With the cassette compartment assembly ❺ pushed in arrow 🅒 direction, distort tabs ⓑ and ⓒ of MD side plate toward the arrow 🅓 to disengage from catches ⓓ and ⓔ of cassette compartment assembly respectively. In such a case, insert a screwdriver between MD side plate and catch and disengage the tab ⓑ first, then disengage the tab ⓒ for easy removal as shown in Fig. b.
5) Raise the cassette compartment assembly ❺ in the opposite direction of arrow 🅒 until the shafts ⓕ and ⓖ are disengaged, and push left and right side plates toward arrow 🅓 to remove the cassette compartment assembly.

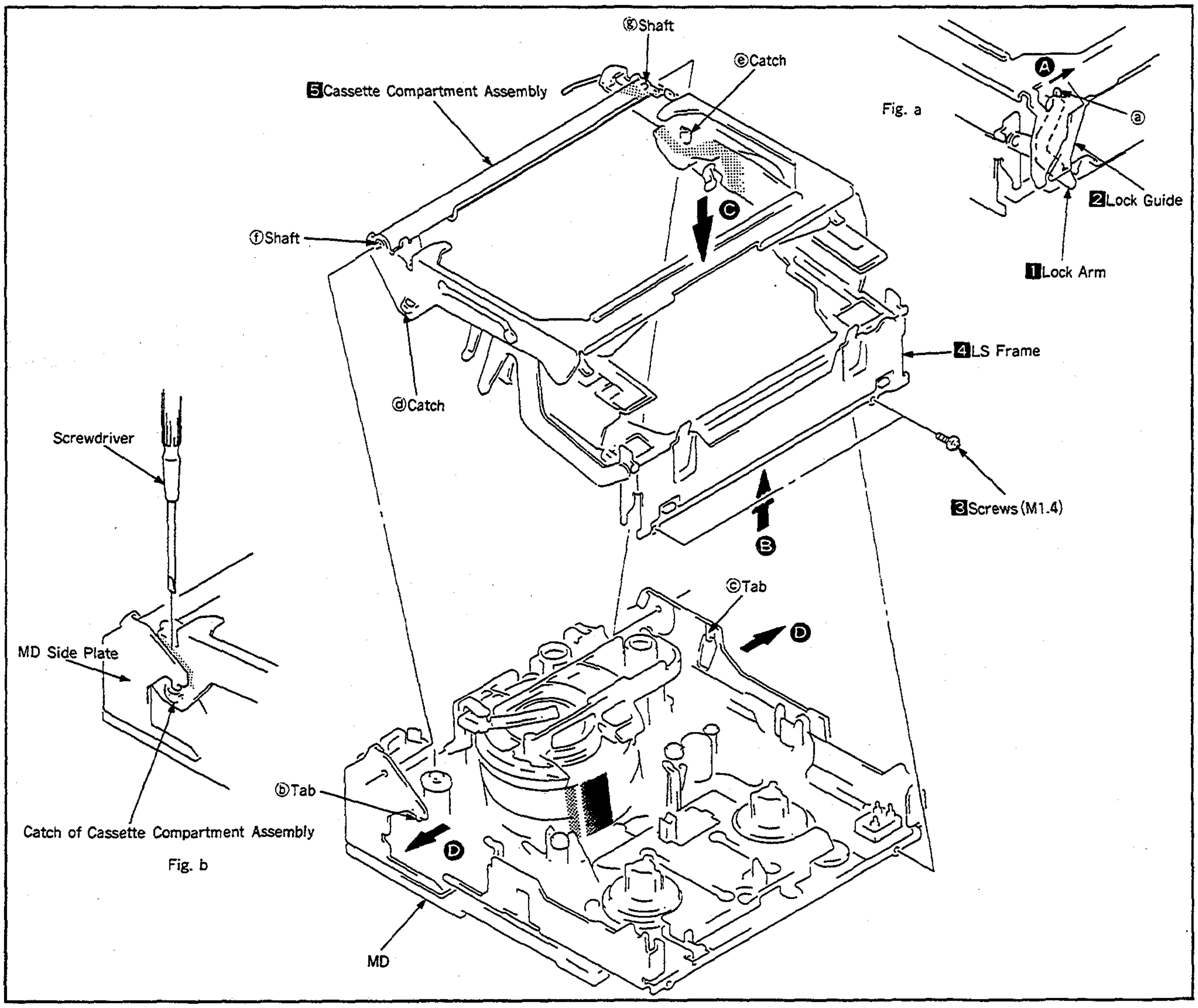

ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
Fig. a
🅐
ⓐ
❷Lock Guide
❶Lock Arm
ⓕShaft
🅒
❹LS Frame
ⓓCatch
Screwdriver
❸Screws (M1.4)
🅑
ⓒTab
🅓
MD Side Plate
ⓑTab
Catch of Cassette Compartment Assembly
Fig. b
🅓
MD

Fig. 1

2. Mounting (Fig. 2)

1) Select the USE mode.
2) Draw the cassette holder 6 of cassette compartment assembly 5 toward the arrow Ⓔ, and lower the LS frame 4 toward the arrow Ⓕ.
3) With the cassette compartment assembly 5 tilted by about 45° against MD, insert shafts ⓕ and ⓖ of cassette compartment assembly into holes ⓗ and ⓘ of MD side plate respectively.
   At this time, the part ⓙ of torsion bar must be positioned on the side ⓚ of LS flexible board (FP-443) (not on the side ⓛ), as shown in Fig. c.
4) Holding holes ⓗ and ⓘ of MD side plate, press the cassette compartment assembly 5 so that its catches ⓓ and ⓔ are engaged with tabs ⓑ and ⓒ of MD side plate. In such a case, the lock arm 1 of cassette compartment assembly must be inserted into a groove in the guide rail 7 on the MD side plate as shown in Fig. d.
5) Insert left and right side plates ⓜ and ⓝ of LS frame 4 inside the LS chassis 8.
6) Push down the cassette compartment to lock.

Note : Make sure that the shafts ⓕ, ⓖ and the tabs ⓞ, ⓟ are set in the MD side plate properly.

7) Tighten two screws 3.

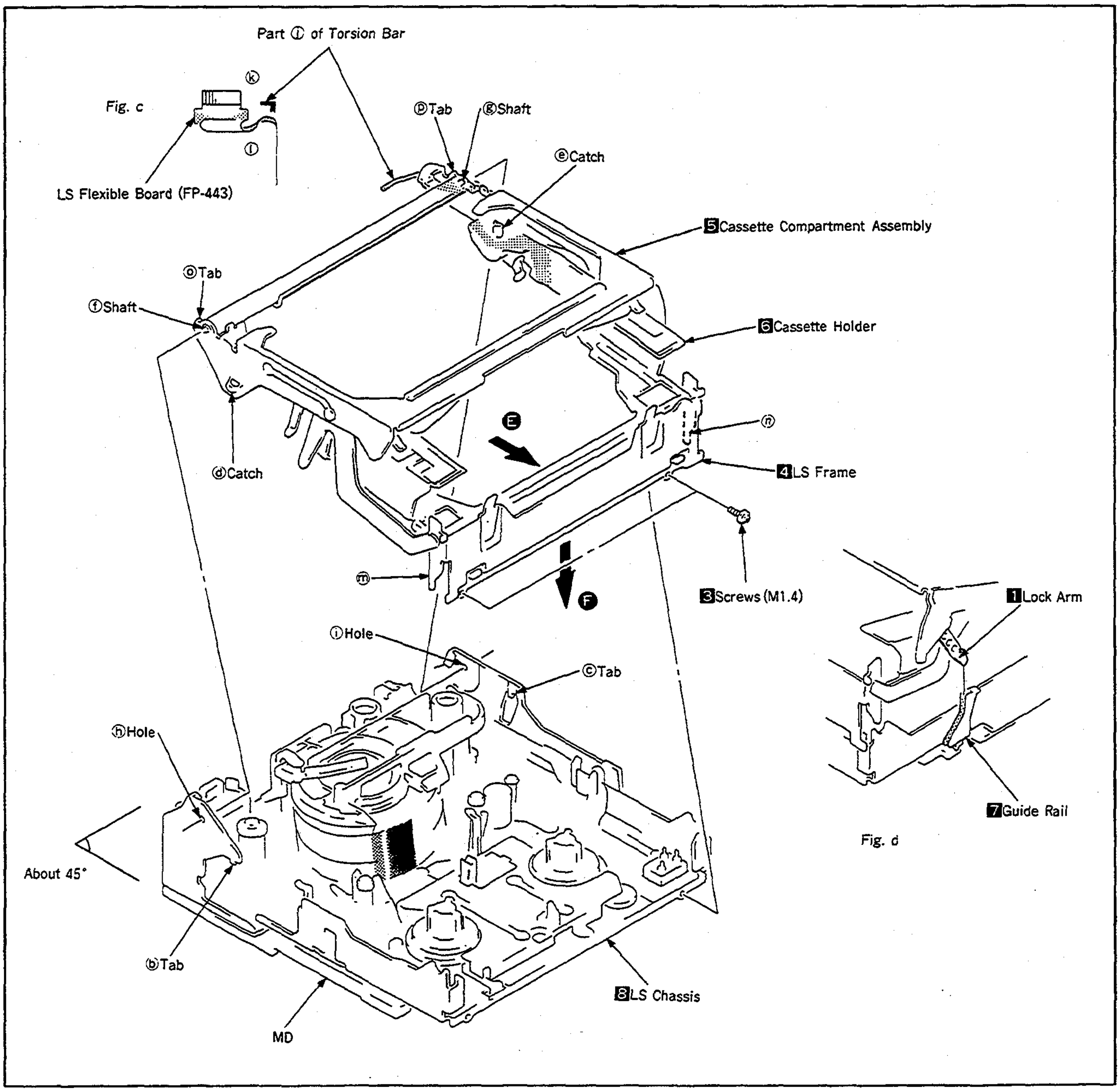

Part ⓙ of Torsion Bar
ⓚ
Fig. c
ⓛ
LS Flexible Board (FP-443)
ⓟTab
ⓖShaft
ⓔCatch
5Cassette Compartment Assembly
ⓞTab
ⓕShaft
6Cassette Holder
Ⓔ
ⓝ
ⓓCatch
4LS Frame
ⓜ
Ⓕ
3Screws (M1.4)
1Lock Arm
ⓘHole
ⓒTab
ⓗHole
7Guide Rail
Fig. d
About 45°
ⓑTab
8LS Chassis
MD

Fig. 2

1-2. OPERATION WITH CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera removed. (Make the mechanical deck ready to operate.)
2) Place the cap 2 on the Reflector C 1.
3) Press the pin of the push switch 3 (ON state) and fix it with adhesive tape 4 in that state.

Note : Press the asterisked (∗) pin to set the REC mode.
(This is not required for the other modes.)

4) Push the cassette compartment DOWN switch 5 in an arrow direction as shown in Fig. a.

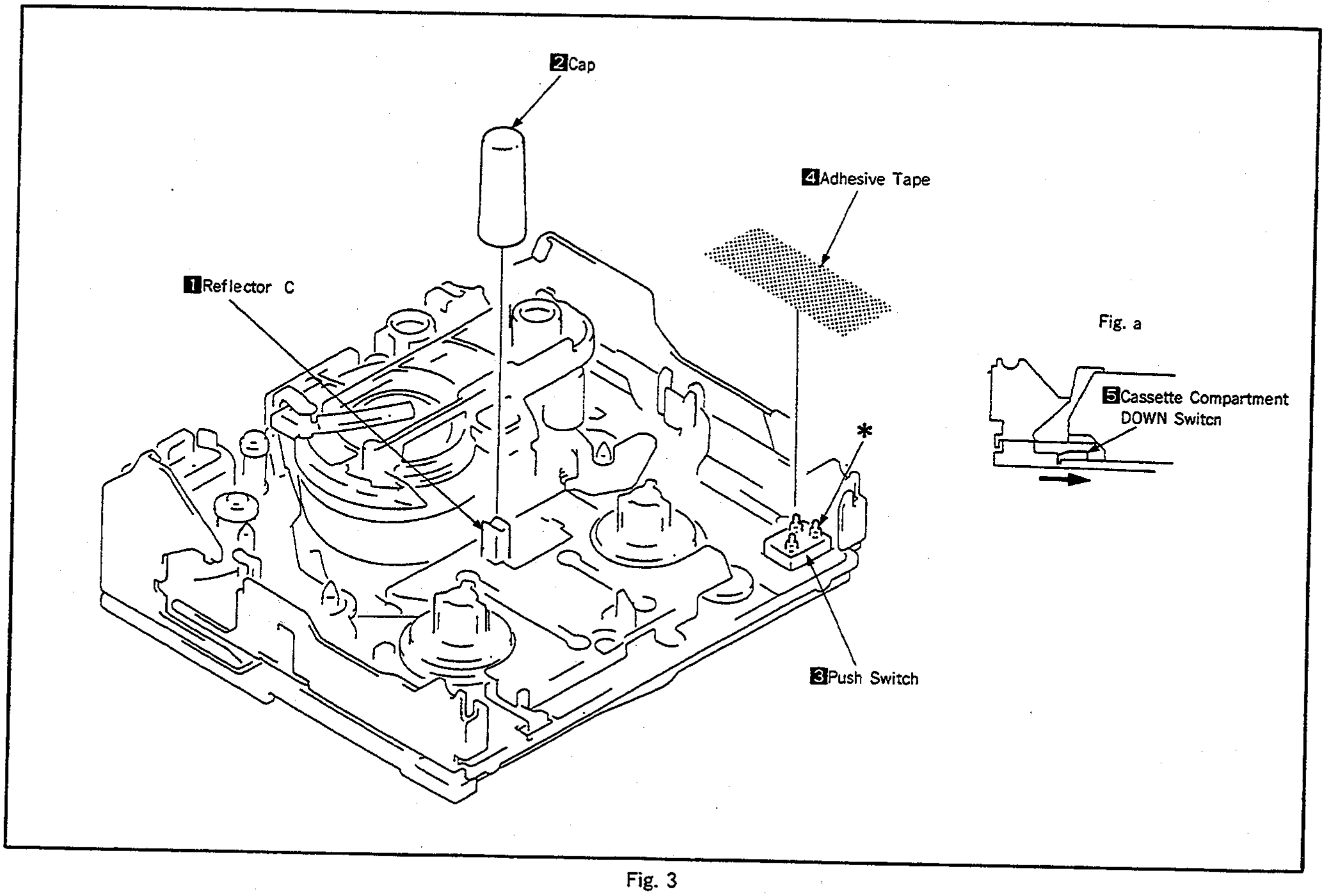

2Cap
4Adhesive Tape
1Reflector C
Fig. a
5Cassette Compartment DOWN Switcn
*
3Push Switch

Fig. 3

1-3. HANDLING OF MODE SELECTOR

- Stick the MD process table label to the mode selector IV panel, then mount the panel on the mode selector.
  U,U', FL, O, O' and A mechanisms have different mode indications respectively. Select your disired type. (Fig.4)

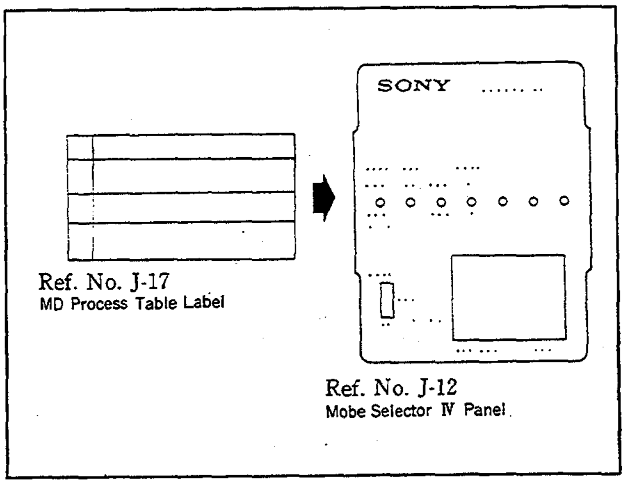

SONY
Ref. No. J-17
MD Process Table Label
Ref. No. J-12
Mobe Selector IV Panel.

Fig. 4

1 Construction (Fig.5)

2 Connection (Fig.6)

For CCD-FX410 series

1) Insert the FP-425 flexible connector **1** and M-SW connector **2** into the mode selector IV conversion connector **3** respectively.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, END, EJECT, USE, LOAD, READY,TURN, REC and FF light up in that order.
4) When changing over from the FF mode back to the END mode, press the left M mode selector botton to select your desired mode.

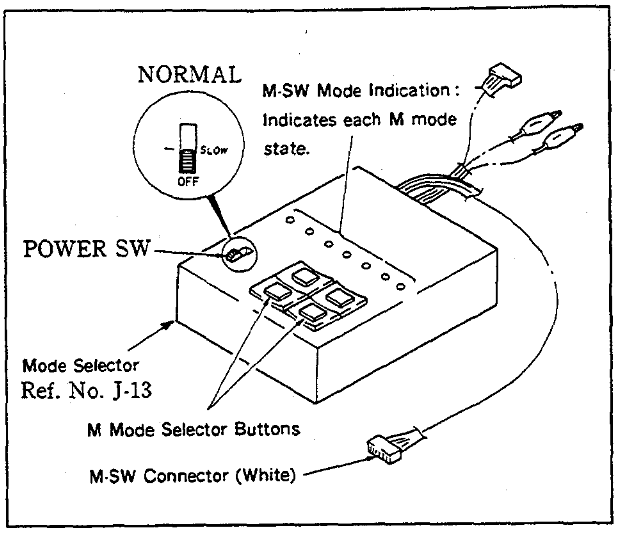

NORMAL
SLOW
OFF
POWER SW
M-SW Mode Indication: Indicates each M mode state.
Mode Selector
Ref. No. J-13
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

For CCD-FX410 series

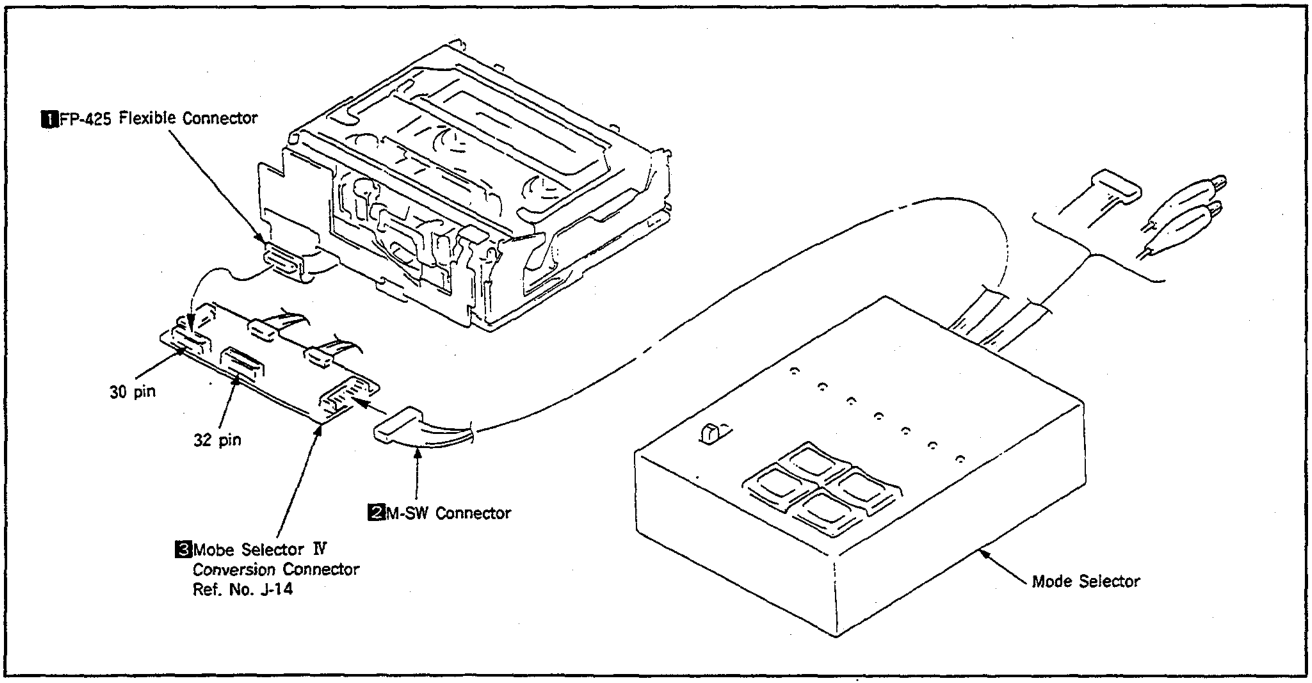
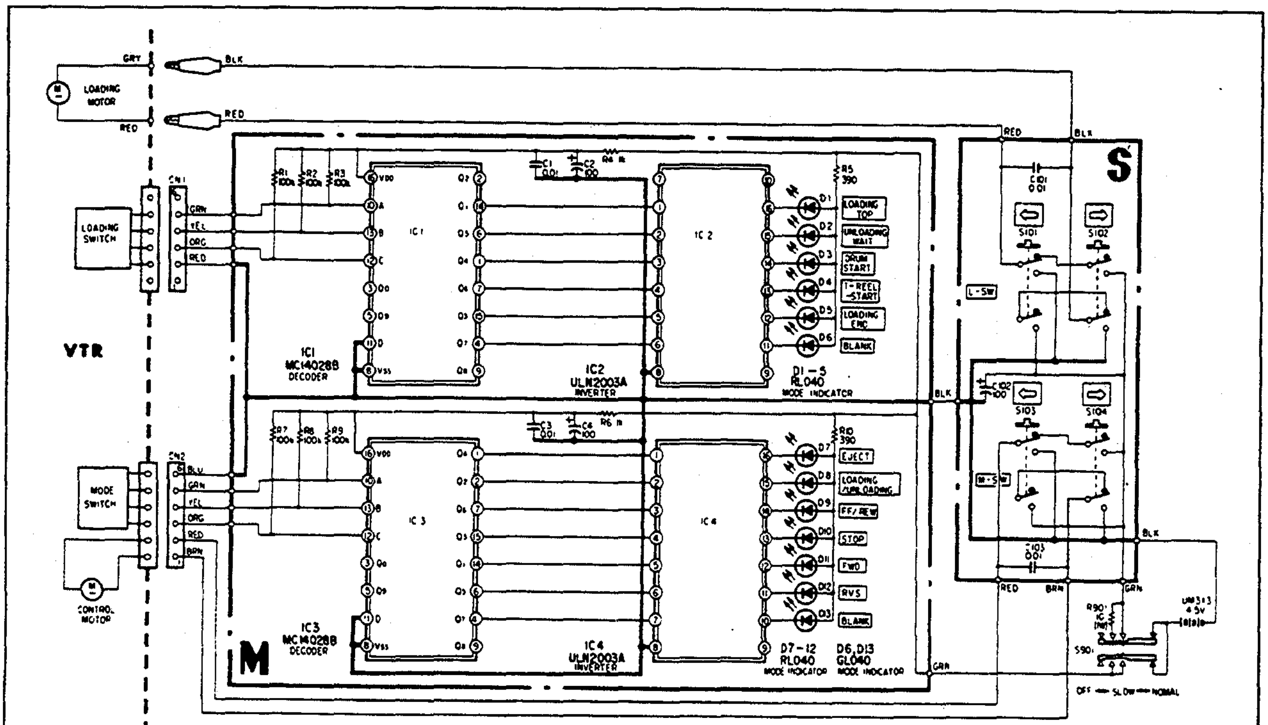

1 FP-425 Flexible Connector
30 pin
32 pin
2 M-SW Connector
3 Mobe Selector IV Conversion Connector Ref. No. J-14
Mode Selector

Fig. 6

1-4. MODE SELECTOR SCHEMATIC DIAGRAM


GRY
BLK
LOADING MOTOR
RED
CN1
LOADING SWITCH
GRN
YEL
ORG
RED
VTR
CN2
MODE SWITCH
BLU
BRN
CONTROL MOTOR
R1 100k
R2 100k
R3 100k
C1 0.01
C2 100
R4 1k
IC1
IC1 MC14028B DECODER
IC2 ULN2003A INVERTER
R5 390
D1
D2
D3
D4
D5
D6
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL -START
LOADING END
BLANK
D1-5 RL040 MODE INDICATOR
R7 100k
R8 100k
R9 100k
C3 0.01
C4 100
R6 1k
IC 3
IC 4
R10 390
D7
D8
D9
D10
D11
D12
D13
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
IC3 MC14028B DECODER
IC4 ULN2003A INVERTER
D7-12 RL040 MODE INDICATOR
D6, D13 GL040 MODE INDICATOR
M
S
C101 0.01
S101
S102
L-SW
C102 100
S103
S104
M-SW
C103 0.01
BLK
GRN
R901
UM3×3 4.5V
S901
OFF ← SLOW ← NORMAL

M-SW
IC 31

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1 INPUT LEVEL H

L-SW
IC 11

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL -START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END ← LOADING TOP
M-SW RVS ← EJECT

⇨ L-SW LOADING TOP ← LOADING END
M-SW EJECT ← RVS

1-5. MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description			
		CAPACITOR			
C1	1-108-579-00	MILER	0.01μF	50V	
C2	1-123-333-00	ELECT	100μF	24V	
C3	1-108-579-00	MILER	0.01μF	50V	
C4	1-123-333-00	ELECT	100μF	24V	
C101	1-108-579-00	MILER	0.01μF	50V	
C102	1-123-333-00	ELECT	100μF	24V	
C103	1-108-579-00	MILER	0.01μF	50V	
		DIODE			
D1	8-719-812-31	DIODE TLR123			
D2	8-719-812-31	DIODE TLR123			
D3	8-719-812-31	DIODE TLR123			
D4	8-719-812-31	DIODE TLR123			
D5	8-719-812-31	DIODE TLR123			
D6	8-719-812-33	DIODE TLG123A			
D7	8-719-812-31	DIODE TLR123			
D8	8-719-812-31	DIODE TLR123			
D9	8-719-812-31	DIODE TLR123			
D10	8-719-812-31	DIODE TLR123			
D11	8-719-812-31	DIODE TLR123			
D12	8-719-812-31	DIODE TLR123			
D13	8-719-812-33	DIODE TLG123A			

Ref. No	Part No.	Description		
		IC		
IC1	8-752-240-28	IC TC4028BP		
IC2	8-752-120-03	IC μPA2003C		
IC3	8-759-240-28	IC TC4028BP		
IC4	8-759-120-03	IC μPA2003C		
		RESISTOR		
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL	10	1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regarless of the length of use.

2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

2-2. CLEANING OF TAPE PATH (Fig.7)

1) In the USE mode, clean the tape running system (TG - 1,- 2,- 3,- 4,- 5, - 6, - 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

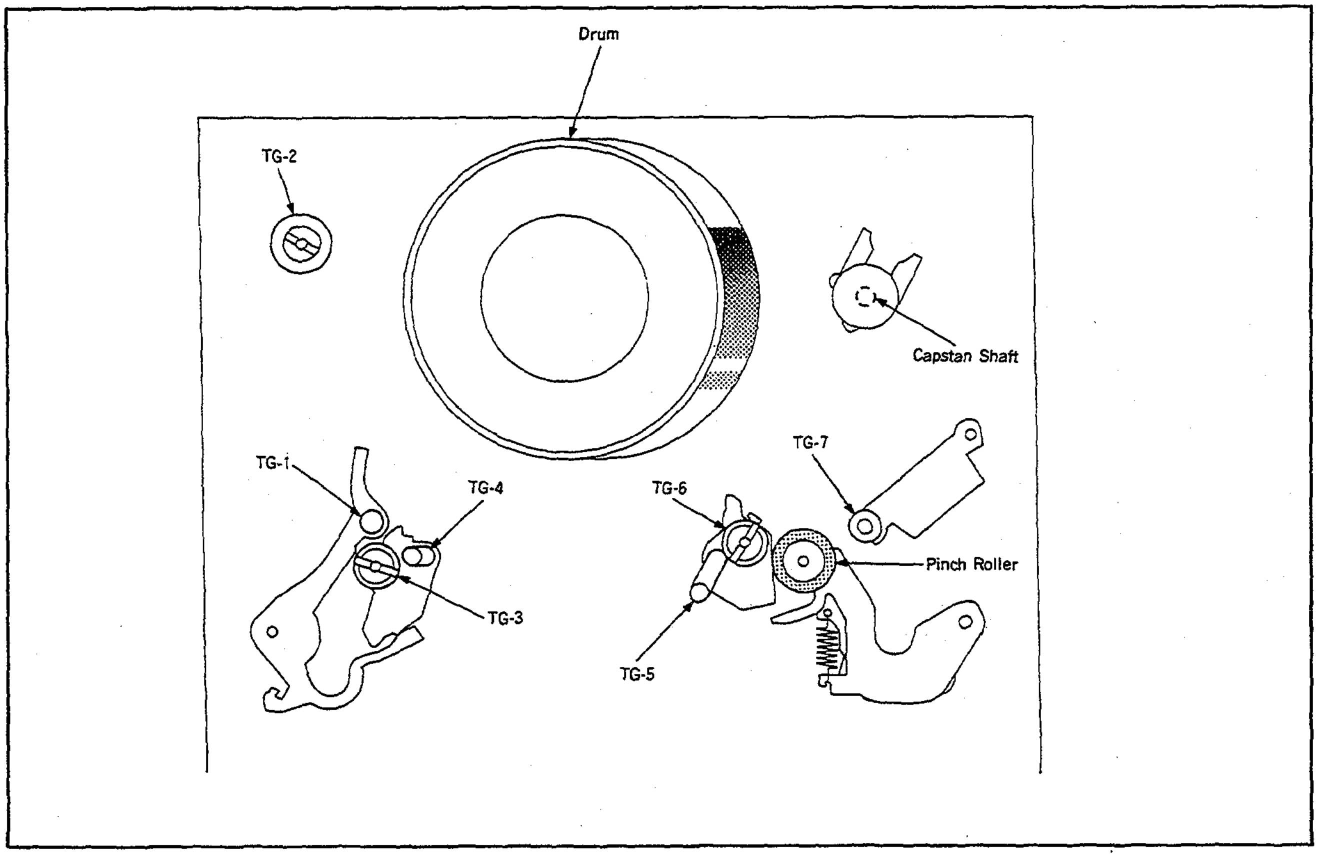


Fig. 7

2-3. PERILDIC CHECK ITEMS

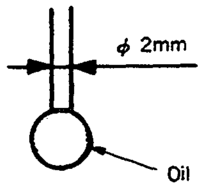
	Location of Maintenance and check	Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-944-539-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-304-A
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

- Be sure to use specified oil. (If you use oil with different viscosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT - 68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.

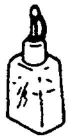


2-4. Service jigs list

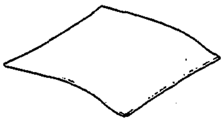
Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector Ⅳ panel	J-6082-105-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector Ⅳ conversion connector	J-6082-167-A		
J-15	FWD B.T. adjusting driver	J-6082-182-A		
J-16	Adjusting remote controller	J-6082-053-B		Tape path (Setting of PATH mode)
J-17	MD process table label	J-6082-166-A		

Other equipment ● Oscilloscope
● Analog tester (20 kΩ)

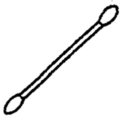
J-1



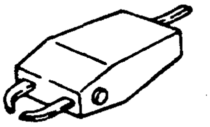
J-2



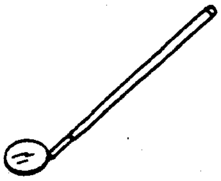
J-3



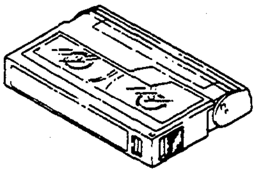
J-4



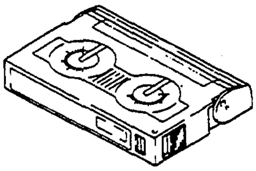
J-5



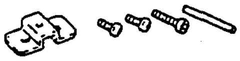
J-6



J-9

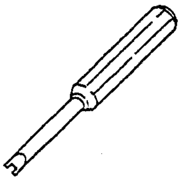


J-10

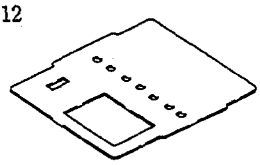


(Attached to the maintenance rotary upper drum)

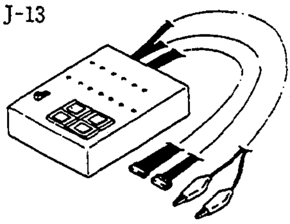
J-11



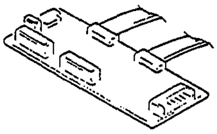
J-12



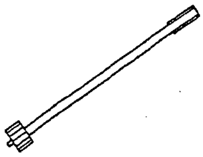
J-13



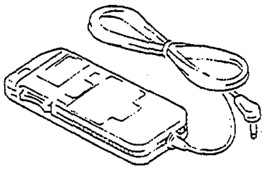
J-14



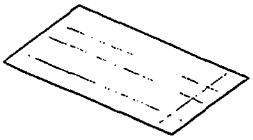
J-15



J-16



J-17



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-13) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1. RETAINER, GOOSENECK ASSEMBLY (Fig. 8)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove a screw ❶.
3) Remove the Retainer, Gooseneck assembly ❷.

2. Mounting

1) Mount the Retainer, Gooseneck assembly ❷ with its two tabs and holes of LS chassis engaged with its hole and a boss of LS chassis.
2) Tighten the screw ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

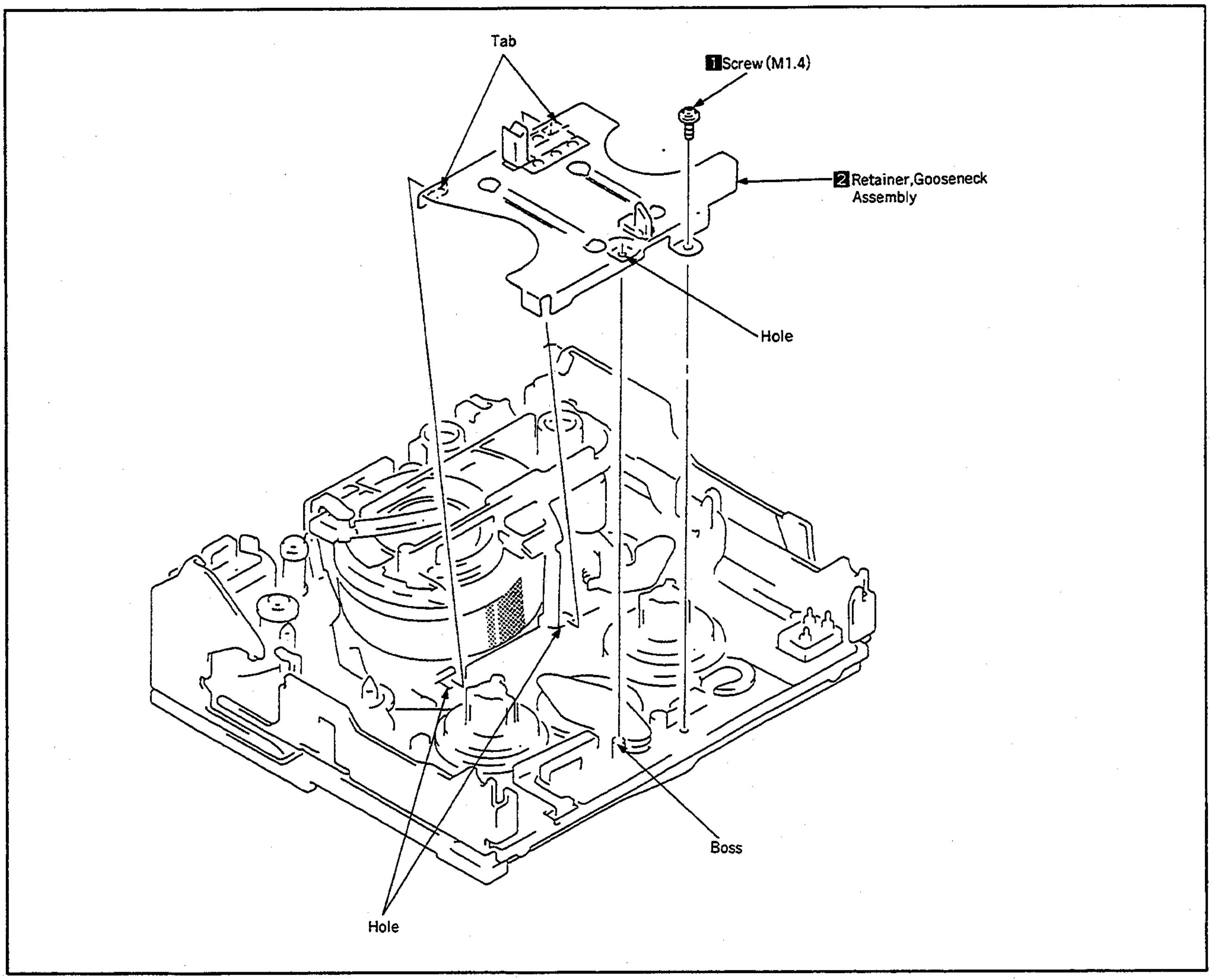


Fig. 8

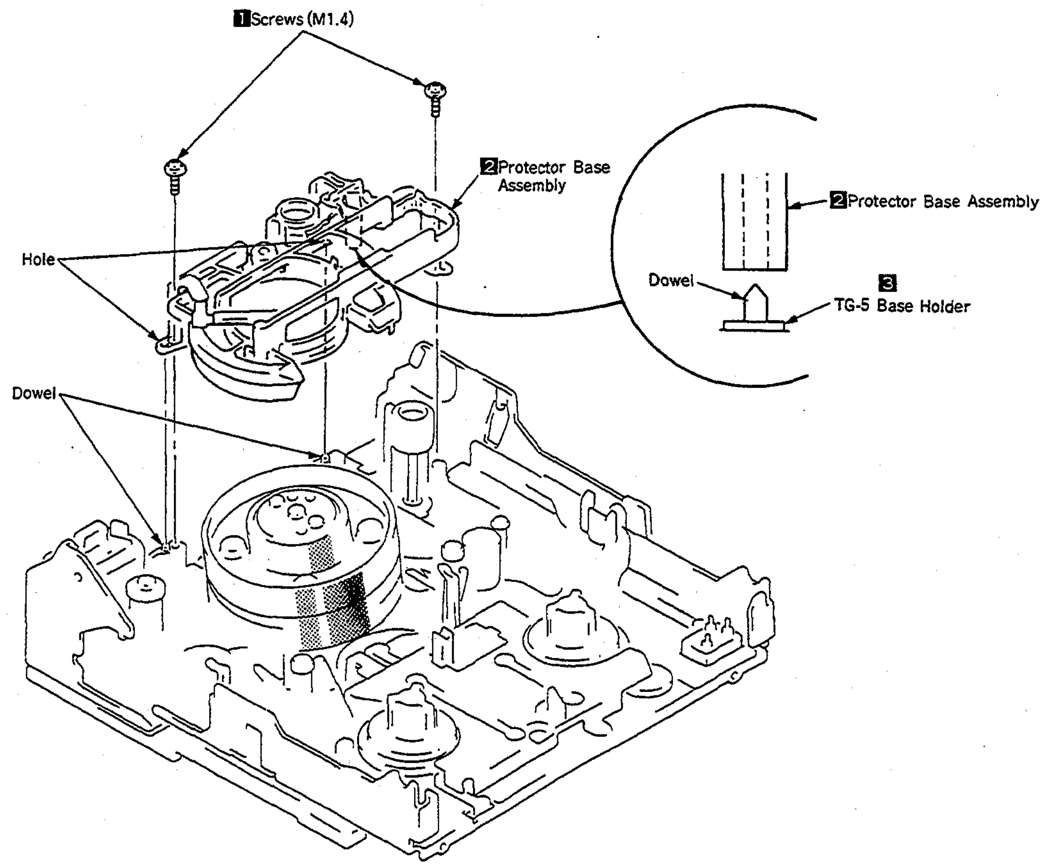
3-2. PROTECTOR BASE ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screws **1**, then the protector base assembly **2**.

2. Mounting

1) Mount the protector base assembly **2** with its three hole engaged with two dowels of mechanical chassis, and a dowel of TG-5 Base Holder **3**.
2) Tighten two screws **1**.
3) Referring to 1-1, mount the cassette compartment assembly.



1 Screws (M1.4)
2 Protector Base Assembly
Hole
Dowel
2 Protector Base Assembly
Dowel
3 TG-5 Base Holder

Fig. 9

3-3. DRUM ASSEMBLY (Fig. 10)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-2, remove the protect base assembly.
3) Disconnect the connector of FP-444 flexible board **1** on the back of MD.
4) Remove three screw **2**, then the drum assembly **3**.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2. Mounting

1) Mount the drum assembly **3** while aligning with two dowels ⓐ of chassis.

Note : Do not touch the outer surfaced of drum (hold portions 🅐 and 🅑 of drum).

2) Tighten three screw assemblies **2** in the order of 1, 2 and 3.

Note : Tighten lightly not to deform the drum lead.

3) Apply a screw locking agent to prevent screws ftom loosening.

Note : In tightening the screws, pushing down the drum extremely will allow the drum to float up.

4) Connect the connector of FP-444 flexible board **1** on the back of MD.
5) Referring to 3-2, mount the protect base assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

Note : After mounting, make tape path adjustment in Section 4.

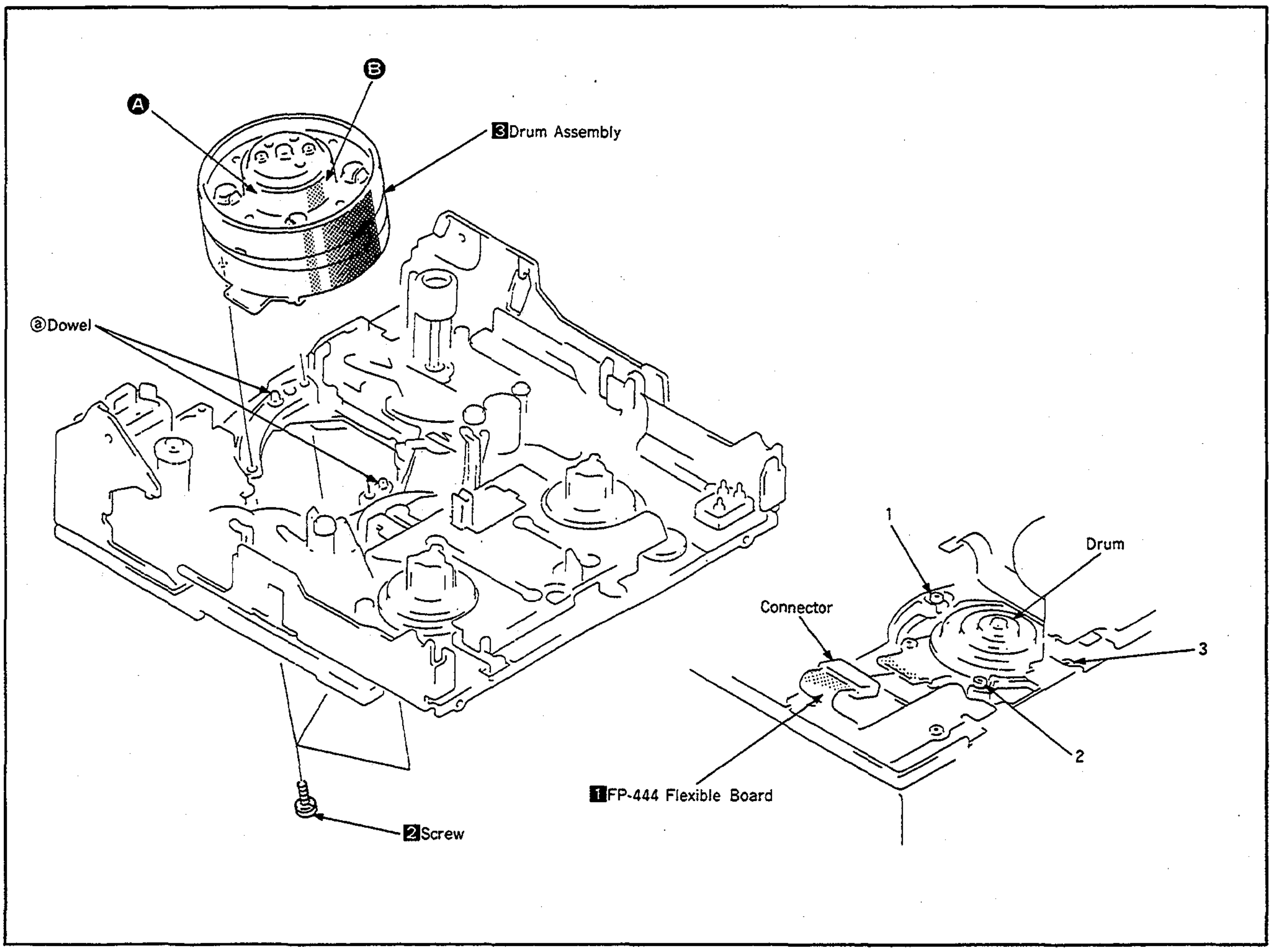


Fig. 10

3-4. CAPSTAN MOTOR ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screw 1, then the capstan cover 2.
3) Remove the screw 3, then the capstan motor assembly 4.

2. Mounting

1) Mount the capstan motor assembly 4 and tighten the scre 3.

Note : In mounting the capstan motor assembly, hold lightly the capstan motor assembly until the rotor gear aligns with the change gear Assy, then insert fully the assembly when both gears are engaged completely by manually rotating the rotor. (Take care not to damage the change gear Assy.)

2) Mount the capstan cover 2 and tighten two screws 1.
3) Referring to 1-1, mount the cassette compartment assembly.

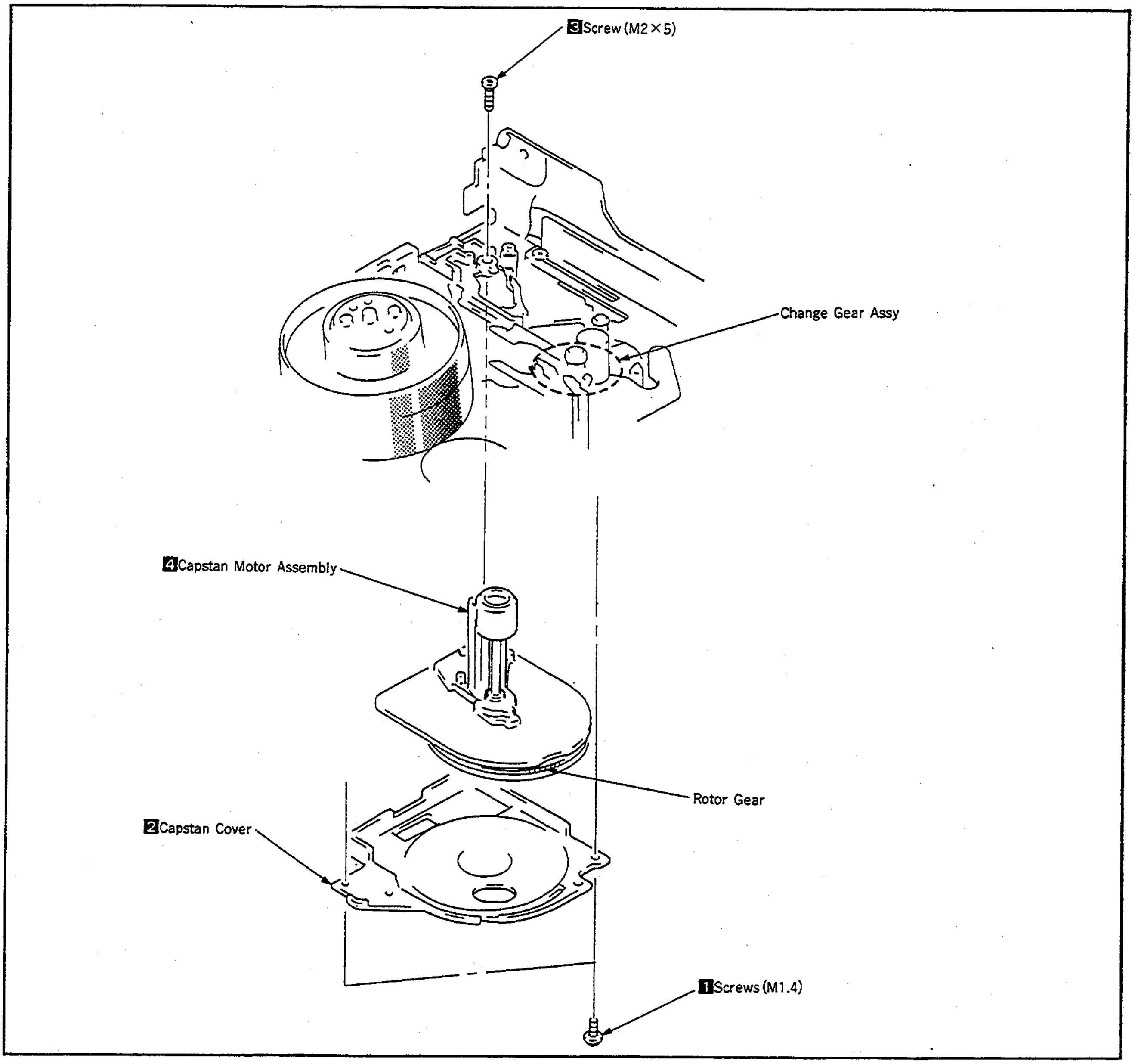

3 Screw (M2×5)
Change Gear Assy
4 Capstan Motor Assembly
Rotor Gear
2 Capstan Cover
1 Screws (M1.4)

Fig. 11

3-5. TAKE-UP REEL TABLE ASSEMBLY AND T- SOFT ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Remove the take-up reel table assembly ❶.
4) Remove the T soft assembly ❷, then the T soft arm ❸.

2. Mounting

1) Mount the T soft arm ❸ with its long hole ⓒ engaged with the boss ⓓ of LS chassis.
2) Mount the T soft assembly ❷ with its tab ⓐ engaged with a square hole ⓑ of T soft arm, as shown in Fig. a.
3) Mount the take-up reel table assembly ❶ and rotate it toward the arrow Ⓐ to be latched with T hard claw.
4) Referring to 3-1. mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

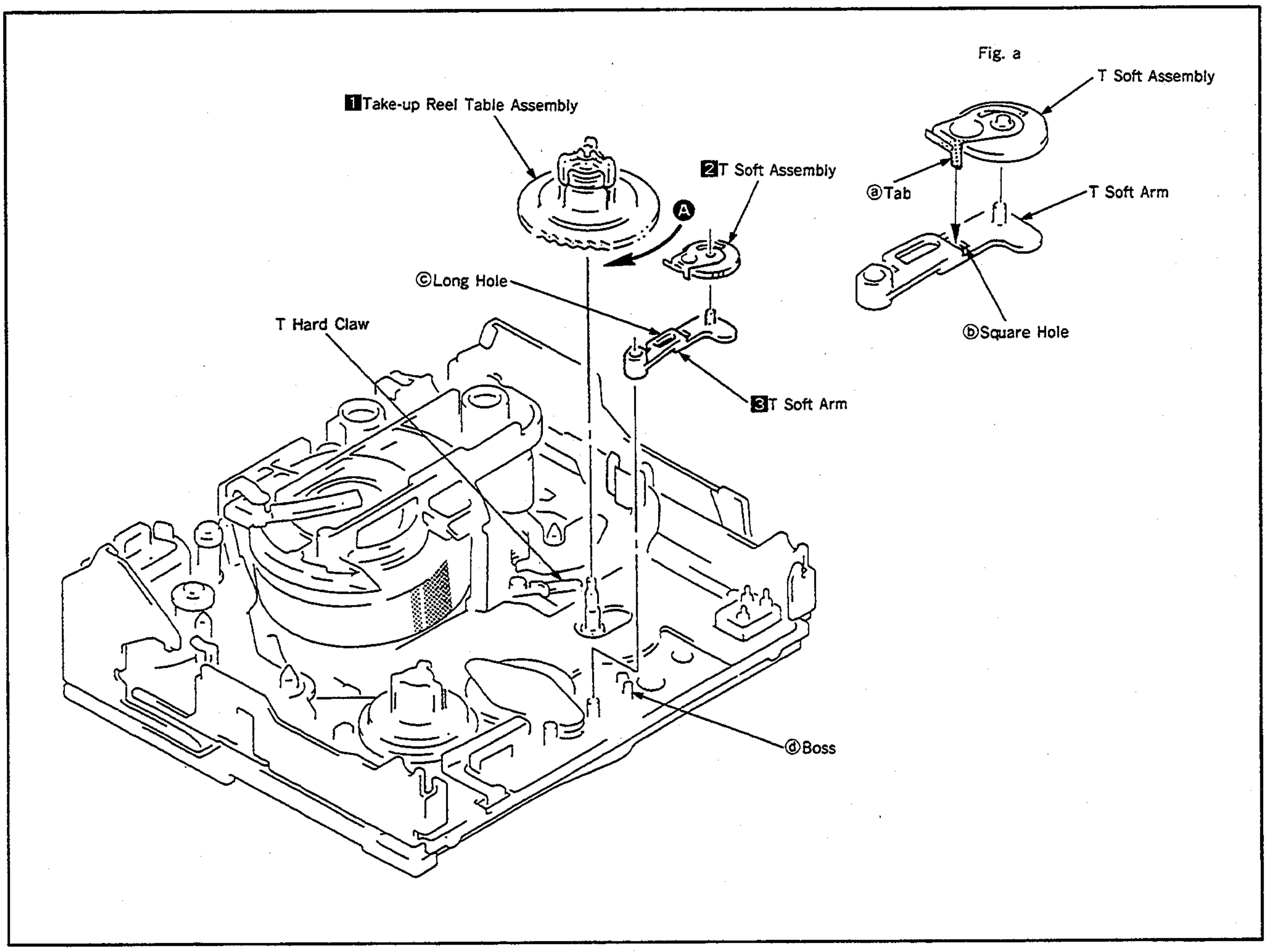

❶Take-up Reel Table Assembly
❷T Soft Assembly
Ⓐ
ⓒLong Hole
T Hard Claw
❸T Soft Arm
ⓓBoss
Fig. a
T Soft Assembly
ⓐTab
T Soft Arm
ⓑSquare Hole

Fig. 12

3-6. PINCH ARM ASSEMBLY (Fig. 13)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Select the READY mode.
3) Remove a washer ❶, then the pinch arm assembly ❷.

2. Mounting

1) Select the READY mode.
2) Hooking a spring of pinch arm assembly ❷ to the casse positioning boss on the chassis, mount the pinch arm asser bly on the shaft of LS chassis assembly as shown in Fig. a.
3) Push in the spring with tweezers up to the root of boss as shown in Fig. b.
4) Mount the washer ❶.
5) Referring to 1-1, mount the cassette compartment assembly.

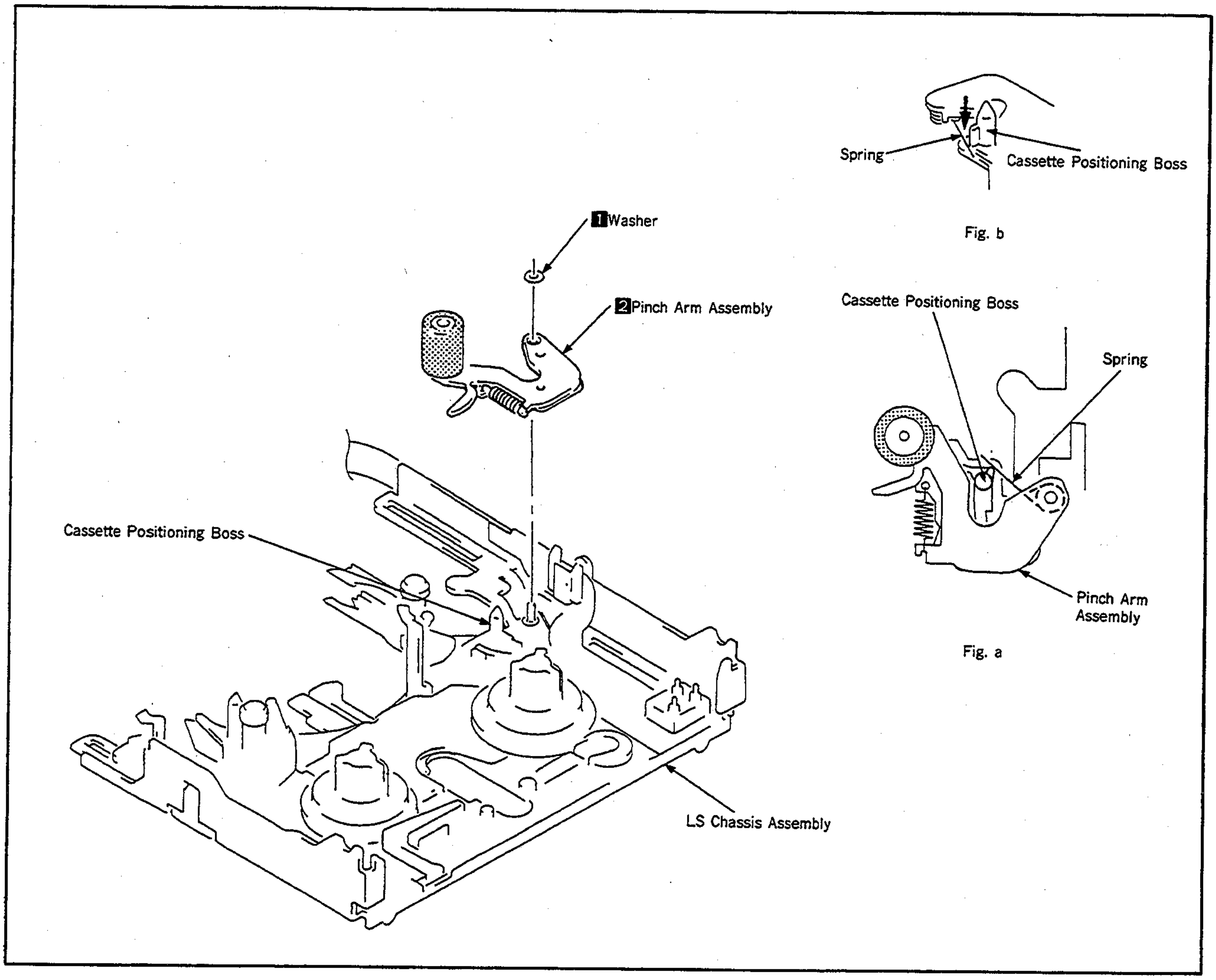

Spring
Cassette Positioning Boss
Fig. b
❶Washer
❷Pinch Arm Assembly
Cassette Positioning Boss
Spring
Cassette Positioning Boss
Pinch Arm Assembly
Fig. a
LS Chassis Assembly

Fig. 13

3- . LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Remove a screw 1, TG-5 base holder 2, and LS flexible board 3.
5) Remove a lock washer 4, then the gooseneck as sembly 5.
6) Remove four screws 6, then the LS chassis assembly 7.

2. Mounting

1) Select the USE mode.
2) Confirm that the T hard claw and the outsert on the back of LS chassis are positioned as shown in Fig. a. (The T hard claw must be higher than corner ⓐ of chassis hole.) If not high, turn the outsert in the arrow direction while pushing the T hard claw from LS chassis to the chassis.
3) Sliding the GL slider, align the top edge of long hole ⓑ in GL slider with the edge face ⓒ of LS chassis hole as shown in Fig. b.
4) Mount the LS chassis assembly 7 on the chassis.

Note : At this time, aligh a dowel ⓓ on LS chassis with a long hole ⓔ of No.7 guide on chassis, a long hole of GL slider with a GL arm pin, a groove of LS cam plate with an LS arm pin respectively as shown in Fig. c and d.

5) Tighten four screws 6.
6) Mount the LS flexible board 3 and TG-5 base holder 2,then tighten the screw 1.
7) Mount the Gooseneck assembly 5 and fix it with a washer 4.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.
10) Referring to 1-1, mount the cassette compartment assembly.

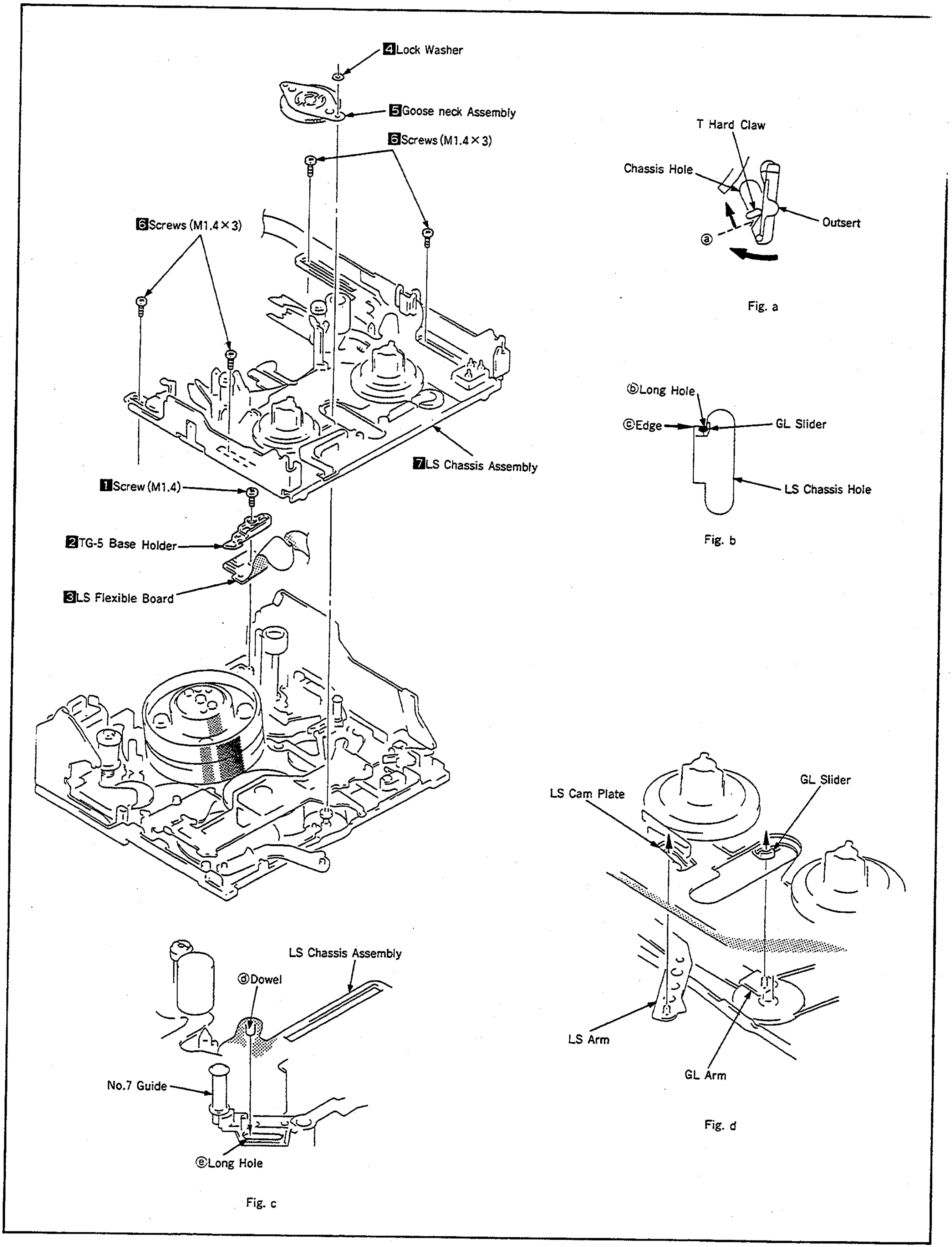

4 Lock Washer
5 Goose neck Assembly
6 Screws (M1.4×3)
6 Screws (M1.4×3)
7 LS Chassis Assembly
1 Screw (M1.4)
2 TG-5 Base Holder
3 LS Flexible Board
T Hard Claw
Chassis Hole
Outsert
ⓐ
ⓑLong Hole
ⓒEdge
GL Slider
LS Chassis Hole
LS Chassis Assembly
ⓓDowel
No.7 Guide
ⓔLong Hole
LS Cam Plate
GL Slider
LS Arm
GL Arm

Fig. a

Fig. b

Fig. c

Fig. d

Fig. 14

3- GUIDE BASE T ASSEMBLY AND GUIDE BASE S ASSEMBLY (Fig. 15, 16)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Push in the GL slider ❶ toward the arrow Ⓐ, and remove the guide base T assembly ❷ and guide base S assembly ❸ from the guide rail respectively as shown in Fig. 15.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T sofr assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

6) Turning the guide base T assembly ❷ and guide base S assembly ❸ respectively, align the shaft to hole to remove as shown in Fig. a.

2. Mounting

1) Turning the guide base T assembly ❷ and guide base S assembly ❸ respectively, align the shaft with a hole to mount as shown in Fig. a (Fig. 15).
2) On the back side of chassis, insert the guide arm T assembly ❹, guide arm S assembly ❺ and GL slider ❶ from position shown in Fig.b to position shown in Fig. c. Also, aligning the guide base T assembly ❷ and guide base S assembly ❸ with the respective guide rails, push in the GL slider ❶ toward the arrow Ⓑ as shown in Fig. 16.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm.

6) Referring to 1-1, mount the cassette compartment assembly.

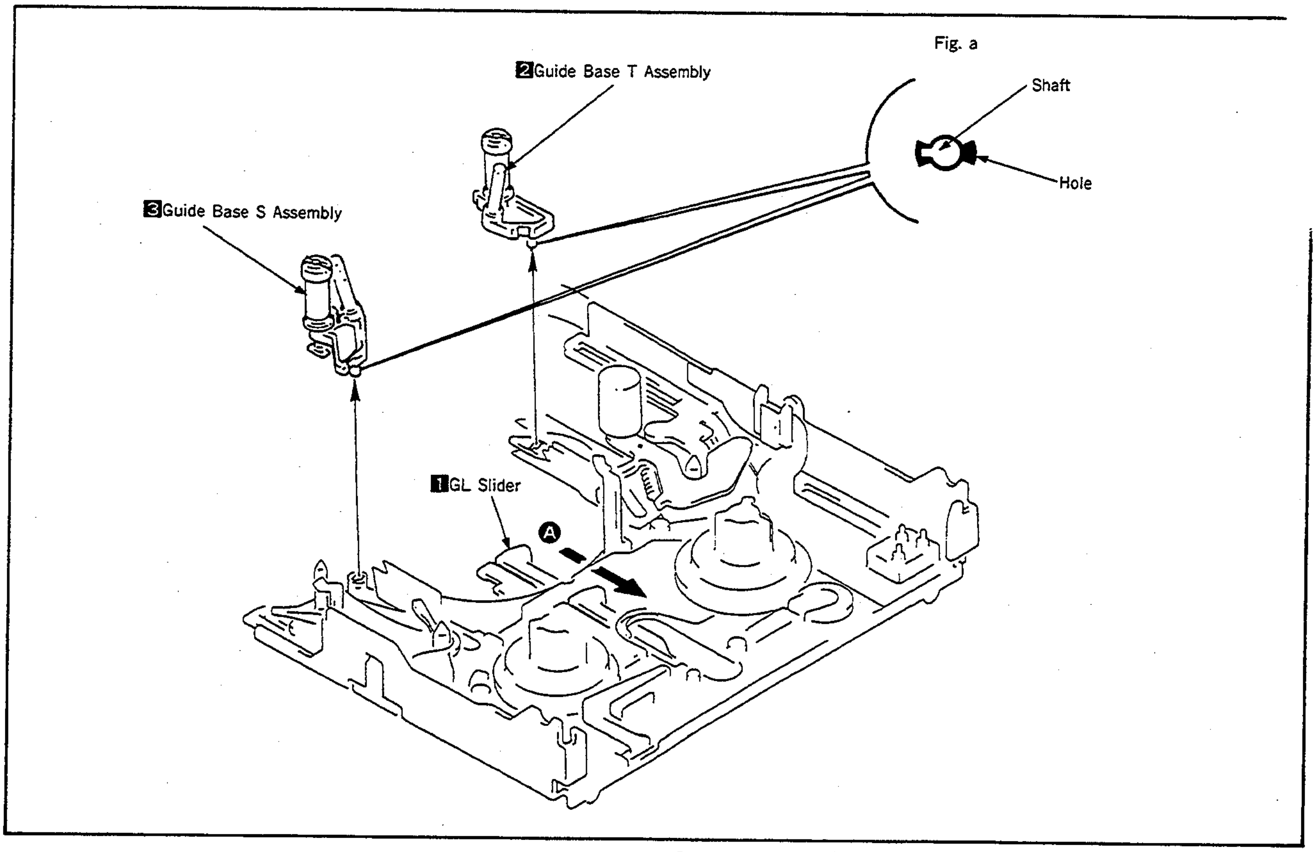


Fig. a
2 Guide Base T Assembly
Shaft
Hole
3 Guide Base S Assembly
1 GL Slider
A

Fig. 15

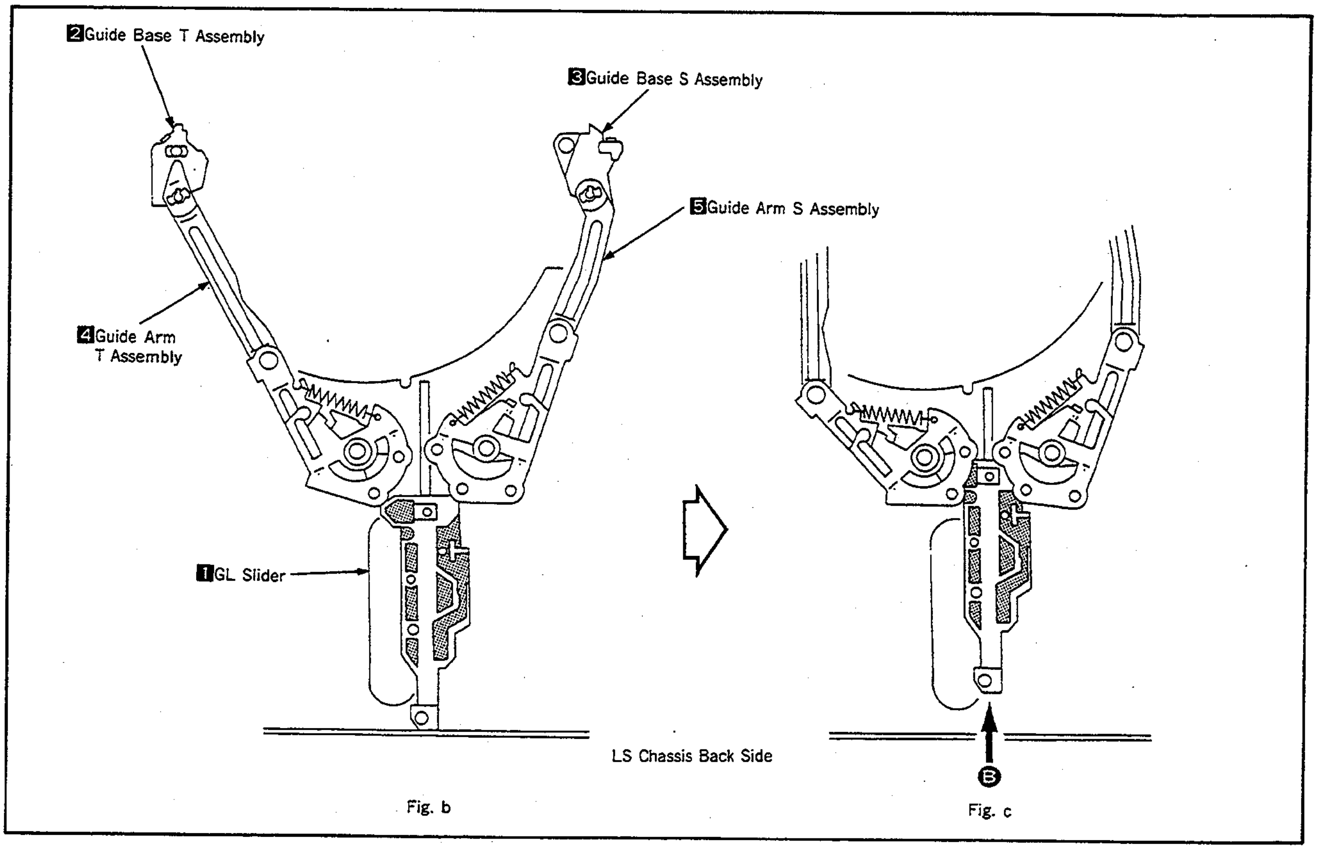

2 Guide Base T Assembly
3 Guide Base S Assembly
5 Guide Arm S Assembly
4 Guide Arm T Assembly
1 GL Slider
LS Chassis Back Side
B

Fig. b

Fig. c

Fig. 16

3· GUIDE ARM T ASSEMBLY AND GUIDE ARM S ASSEMBLY (Fig. 17)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base T assembly and guide base S assembly.
6) Remove lock washers ❶, then the guide arm T assembly ❷ and guide arm S assembly ❸ respectively from the back side of chassis.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assmbly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2. Mounting

1) Mount the guide arm T assembly ❷ and guide arm S assembly ❸, then fix them with a lock washer ❶ respectively.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2) Referring to 3-8, mount the guide base T assembly, guide-base S assembly and GL slider.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

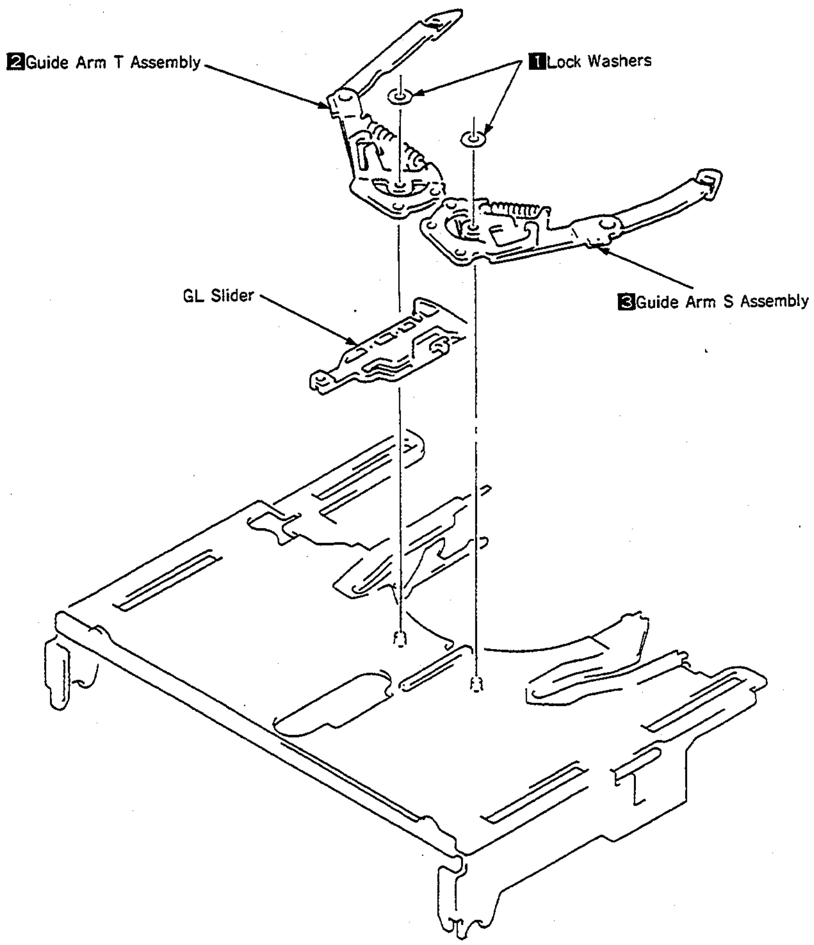


Fig. 17

3-10. SUPPLY REEL TABLE ASSEMBLY AND TG-1 ARM ASSEMBLY (Fig. 18)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base S assembly.
6) Remove a screw 1, then the string 2 from the supply reel table assembly 3. For easy removal of string block 4, insert a flat-blade screwdriver into a groove ⓐ and push it up (Fig. a).
7) Remove the supply reel table assembly 3.
8) Remove a tension coil spring 5.
9) Turn the TG-1 arm assembly 6 up to a portion ⓒ of LS chassis hole in the arrow Ⓐ direction so that its tab ⓑ can be disengaged (Fig. b).

2. Mounting

1) Pushing the S soft brake 7 toward the arrow Ⓑ, mount thesupply reel table assembly 3.
2) Route the string 2 under the TG-1 arm asembly 6, andinsert the tab ⓑ of TG-1 arm assembly into the LS chassis hole ⓒ, then turn the TG-1 arm assembly in the reverse direction of arow Ⓐ (Fig. b).
3) Wind the string 2 along the groove of supply reel t assembly 3 (Fig. a).

Note : Do not curl the string extremely. Also, avoid adhesion oil, otherwise the image will be distorted.

4) Using the FWD B.T. adjusting driver (Ref. No. J-15), shift the string block 4 toward the arrow Ⓒ and tighten the screw 1 (Fig. a).
5) Engage the tension coil spring 5 to the chassis hook.

Note : Confirm that the string 2 is surely wound around the groove of supply reel table assembly 3 (Fig.a).

6) Referring to 3-8, mount the guide base S assembly.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm. (Refer to 3-5 Take-up Reel Table Assembly and Take-up Soft Assembly.)

10) Referring to 1-1, mount the cassette compartment assembly.

Note : Referring to 3-22, adjust the tension regulator position.

Note : Referring to 3-23, adjust the forward back tension.

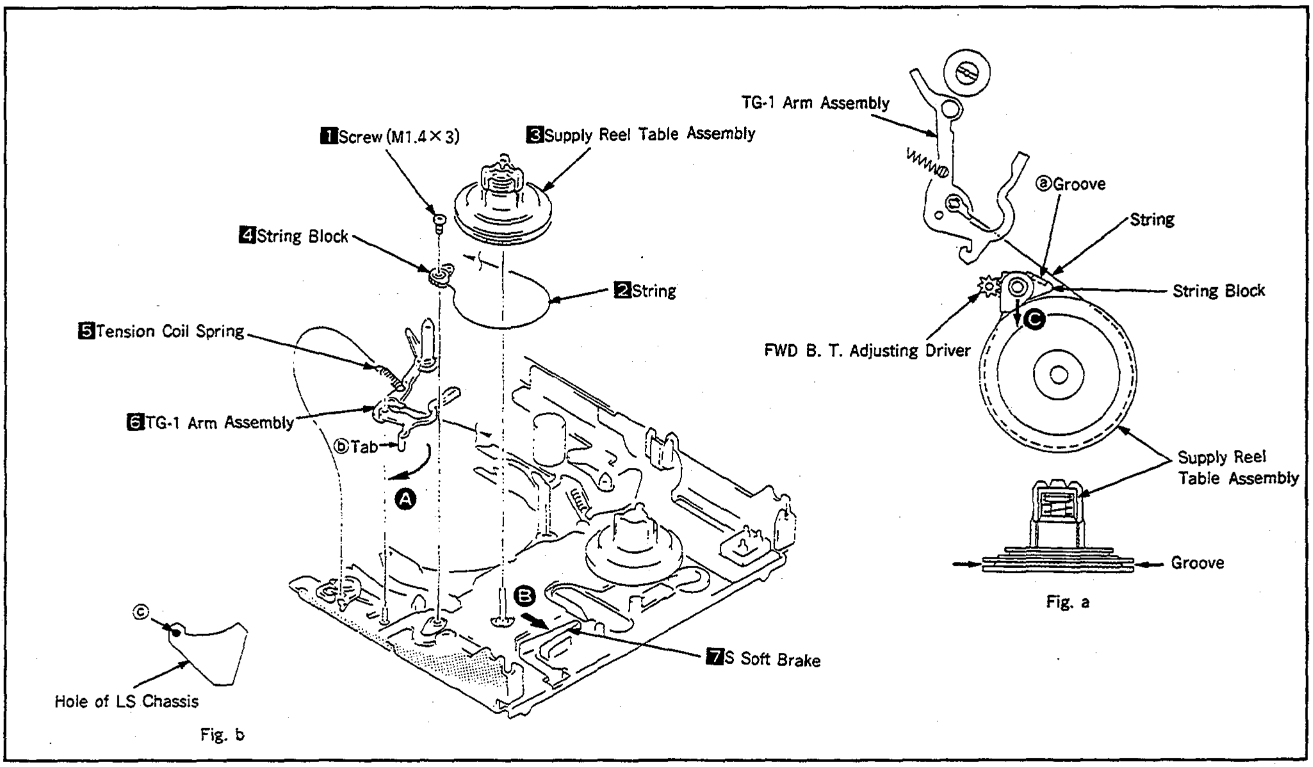

1 Screw (M1.4×3)
3 Supply Reel Table Assembly
4 String Block
2 String
5 Tension Coil Spring
6 TG-1 Arm Assembly
ⓑTab
Ⓐ
Ⓑ
7 S Soft Brake
ⓒ
Hole of LS Chassis
TG-1 Arm Assembly
ⓐGroove
String
String Block
Ⓒ
FWD B. T. Adjusting Driver
Supply Reel Table Assembly
Groove

Fig. a

Fig. b

Fig. 18

3 . TG-2 ROLLER ASSEMBLY (Fig. 19)

1. Removal

1) Remove the TG-2 roller assembly **1** .
2) Remove a compression coil spring **2** .

2.Mounting

1) Insert a compression coil spring **2** into the boss on chassis.
2) Rotate gently the TG-2 roller assembly **1** until the screw is engaged.

3. Presetting of TG-2 Roller Height (Fig. a)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3. 3 ± 0. 05mm.

Note : After adjustment, perform 4. TAPE PATH ADJUSTMENT.

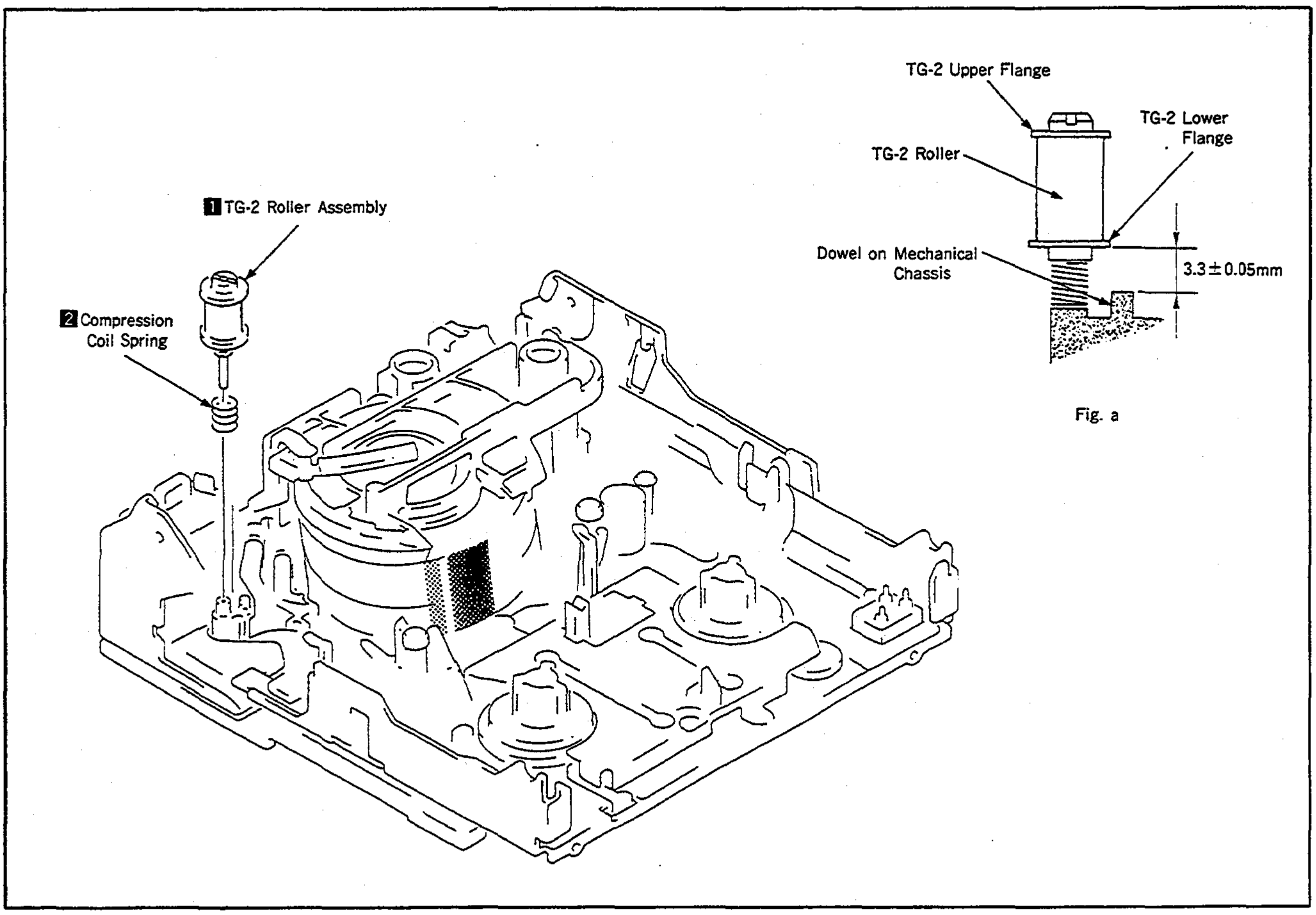

TG-2 Upper Flange
TG-2 Lower Flange
TG-2 Roller
Dowel on Mechanical Chassis
3.3±0.05mm
Fig. a
1 TG-2 Roller Assembly
2 Compression Coil Spring

Fig. 19

3-12. TG-7 ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Raise a portion ⓐ of TG-7 arm Leaf spring 1 in arrow direction with a flat-blade screwdriver or tweezers to disengage the tab from the chassis, then remove the TG-7 arm Leaf spring as shown in Fig. a.
6) Remove the TG-7 assembly 2 from the shaft of mechanical-chassis.

2. Mounting

1) Mount the TG-7 arm assembly 2 to the shaft of mechanic chassis.
2) Mount the TG-7 arm Leaf spring 1 to the mechanicalchasis.
   ***Push in the tab of Leaf spring until it clicks into a detent ofchassis (Fig. a).**
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartmnet assembly.

Note : After mounting, perform 4. TAPE PATH ADJUSTMENT.

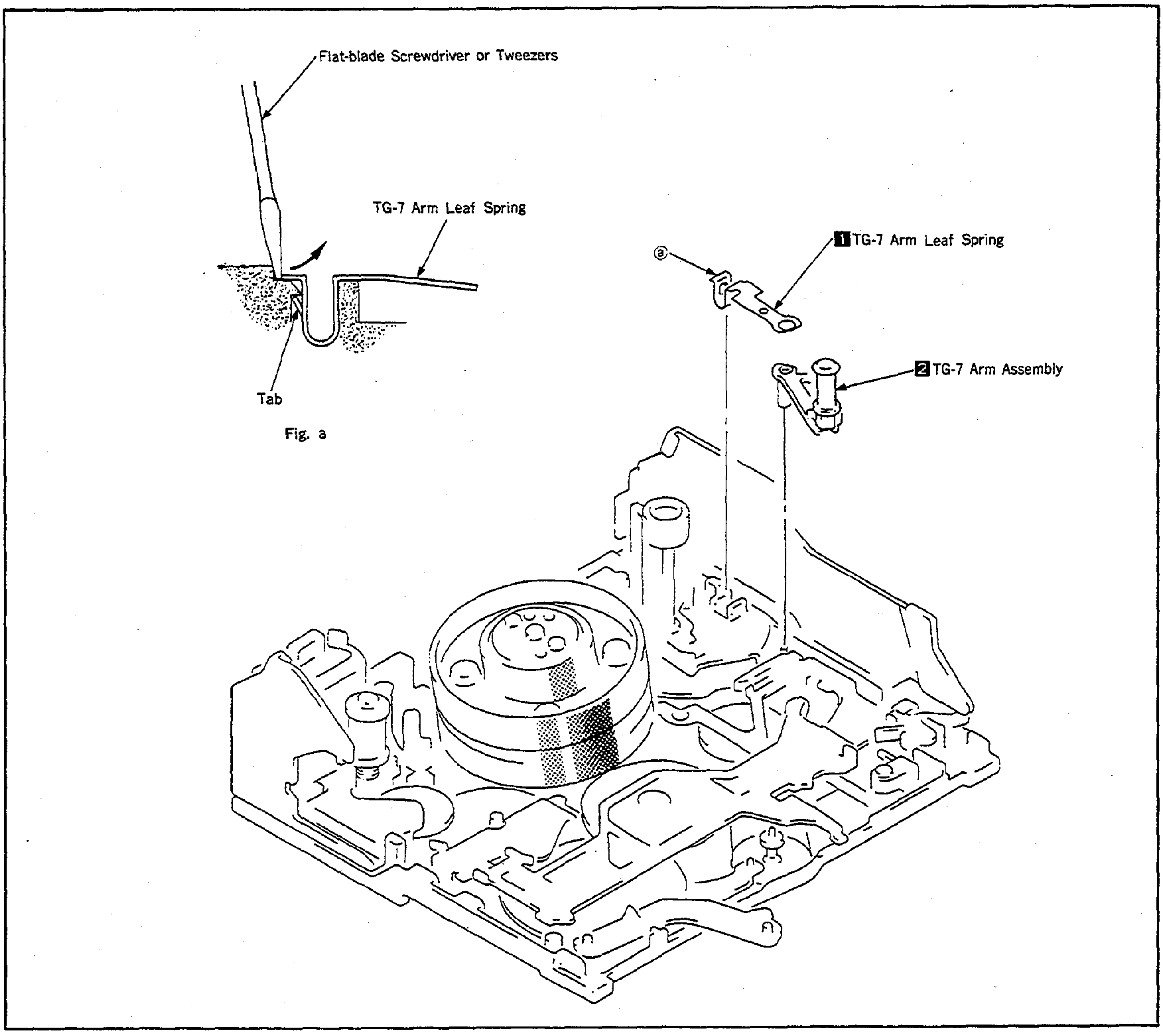


Fig. 20

3 . LM MOTOR ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Select the LOAD mode (at the position where the FF arm assembly is not above the screw ❶).
6) Remove two screws ❶, then the LM motor assembly ❷.

2. Mounting

1) Aligning the dowel ⓐ of LM motor assembly ❷ with the hole ⓑ of mechanical chassis, mount the LM motor assembly with its hole ⓒ inserted into the mechanical chassis shaft ⓓ.
2) Tighten two screws ❶.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

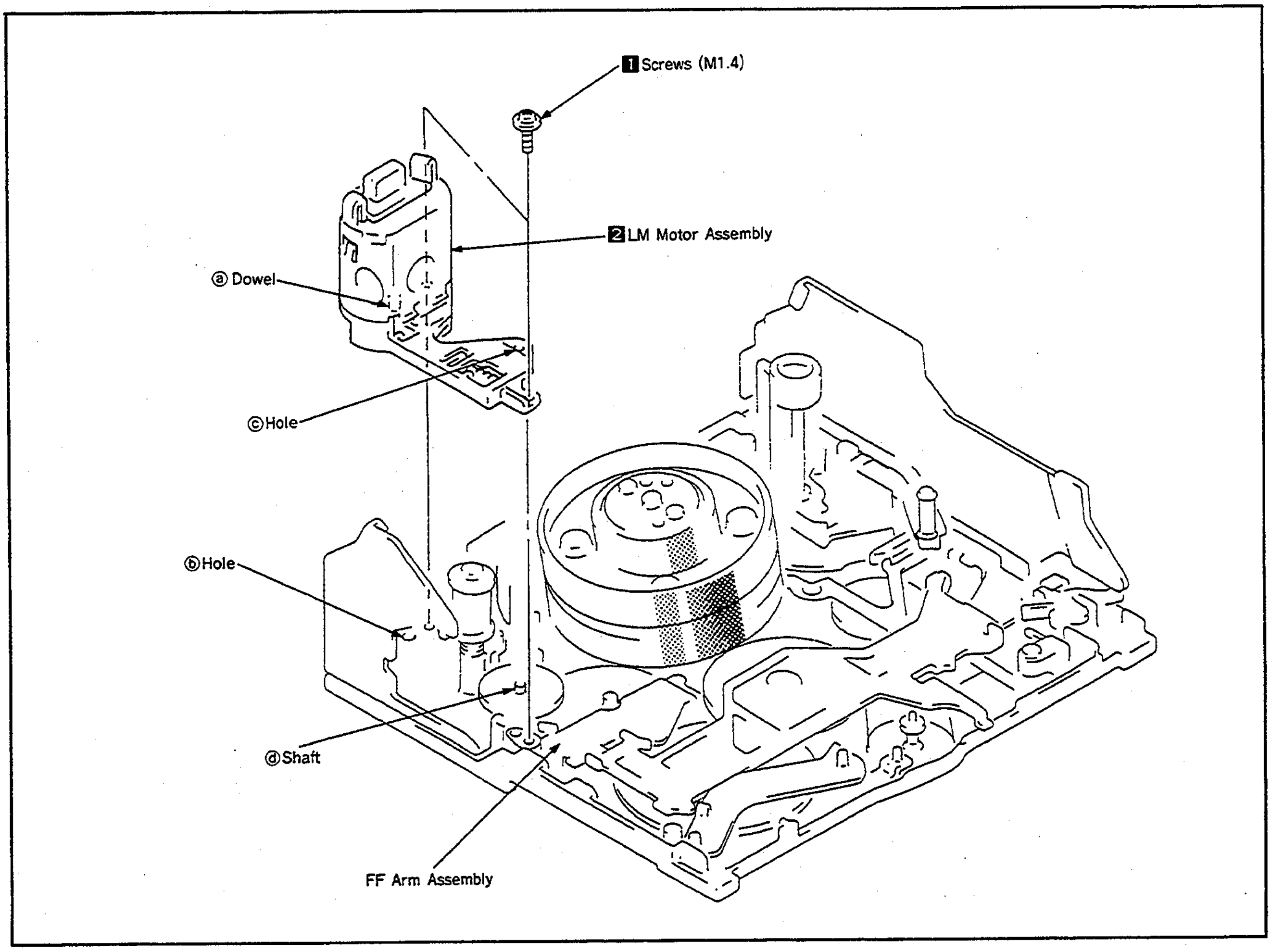


Fig. 21

3-14. LS ARM (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the proctector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove the LS arm ❶ from the shaft of mechanical chassis.

Note : Take care not to drop the LS roller ❷.

2. Mounting

1) Mount the LS arm ❶ meeting with mechanical chassis sh and cam groove.

Note : Move the LS arm ❶ in arrow direction to confirm that the LS roller ❷ is surely inserted.

2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 3-2, mount the protector base assembly.
4) Referring to 3-1, mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

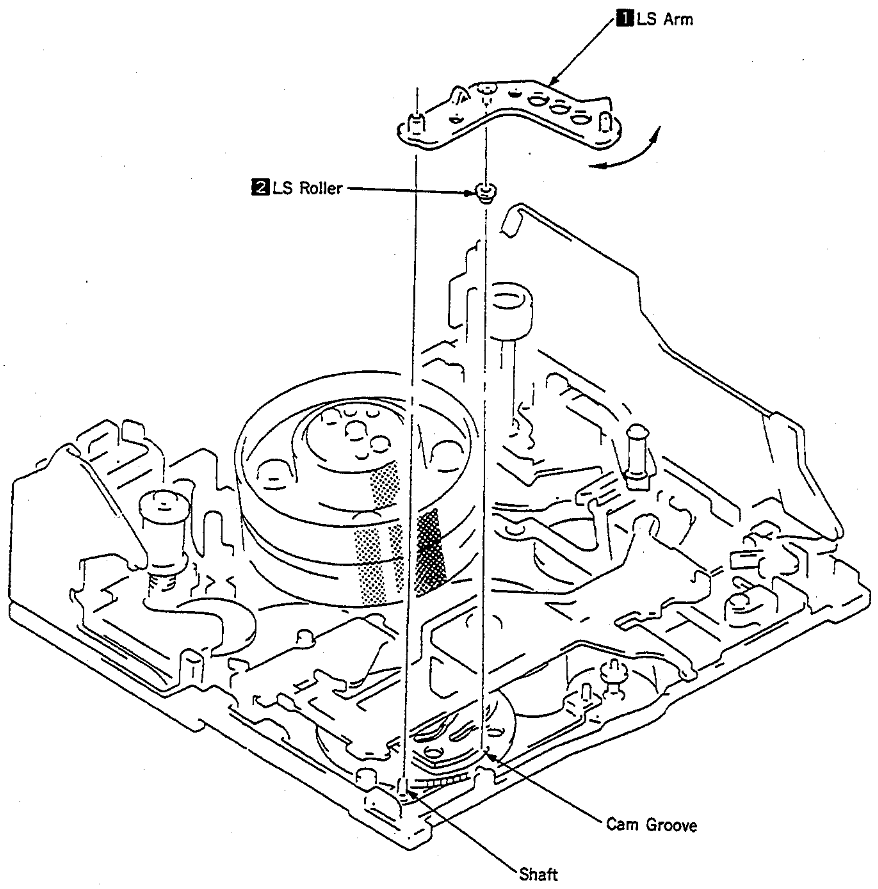


Fig. 22

. M SLIDER ASSEMBLY (Fig. 23)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove two screws ❶, then the gear holder ❷.
6) Remove two lock washers ❸, then the M slider assembly ❹.

2. Mounting

1) Mount the M slider assembly ❹, aligning long holes ⓐ and ⓑ of M slider assembly with shafts ⓒ and ⓓ of mechanical chassis, and a long hole ⓔ with shaft ⓕ of press arm assembly, and also shaft ⓖ with outer groove ⓗ of cam respectively.
2) Mount two lock washers ❸.
3) Mount the gear holder ❷ with its outserts ⓘ and ⓙ inserted into holes in the mechanical chassis.
4) Tighten two screws ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

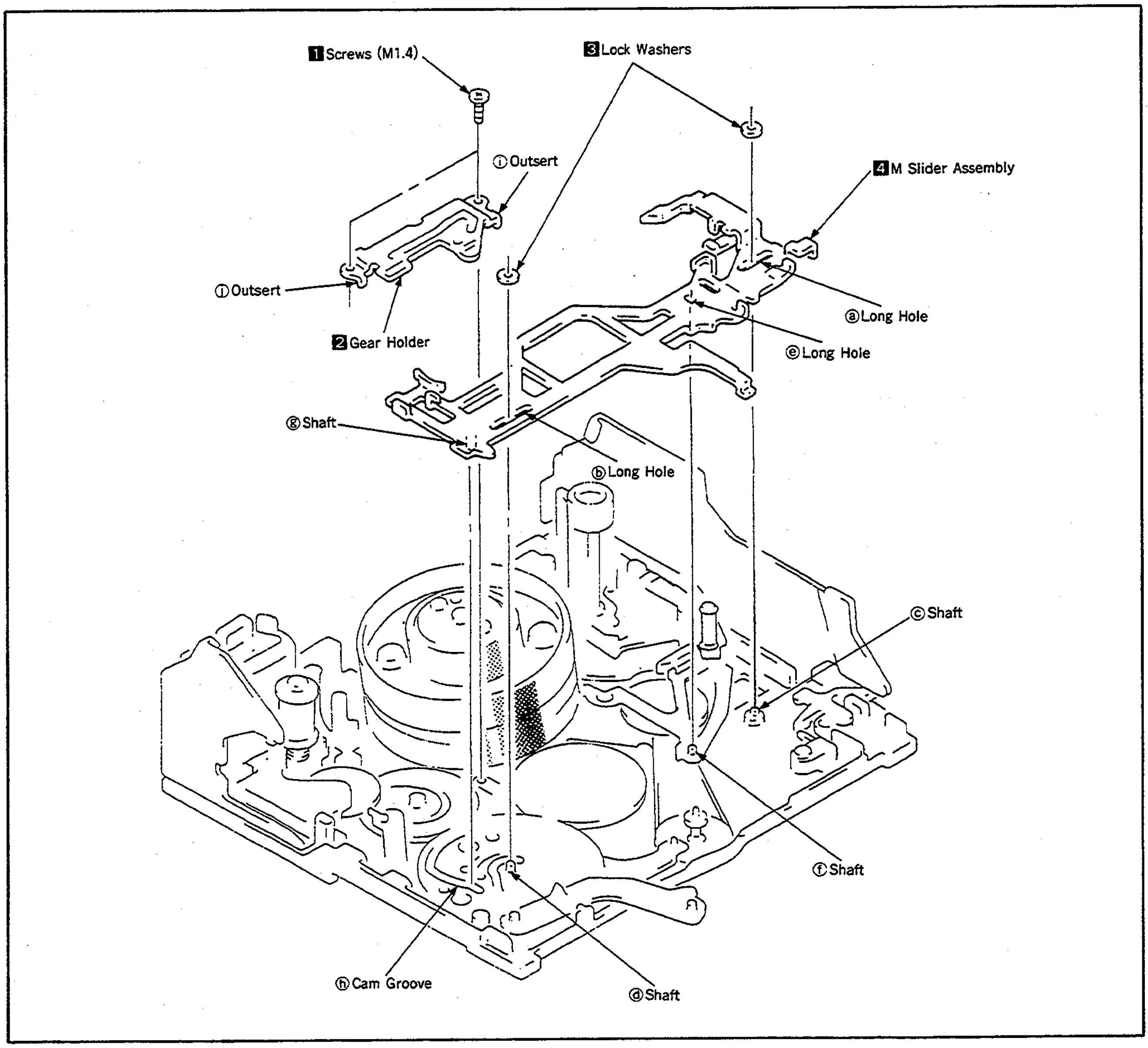

❶ Screws (M1.4)
❸ Lock Washers
ⓙ Outsert
❹ M Slider Assembly
ⓘ Outsert
ⓐ Long Hole
❷ Gear Holder
ⓔ Long Hole
ⓖ Shaft
ⓑ Long Hole
ⓒ Shaft
ⓕ Shaft
ⓗ Cam Groove
ⓓ Shaft

Fig. 23

3-16. PINCH PRESS ARM ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assemvly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove a lock washer ❶, then pinch press arm assembly ❷.

2.Mounting

1) Mount the pinch press arm assembly ❷, inserting its sh ⓐ into the cam groove ⓑ of HC drive arm, and hole ⓒ in the shaft ⓓ of mechanical chassis.
2) Mount the lock washer ❶.
3) After mounting, shift the pinch press arm assembly toward the arrow direction.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-3, mount the drum assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

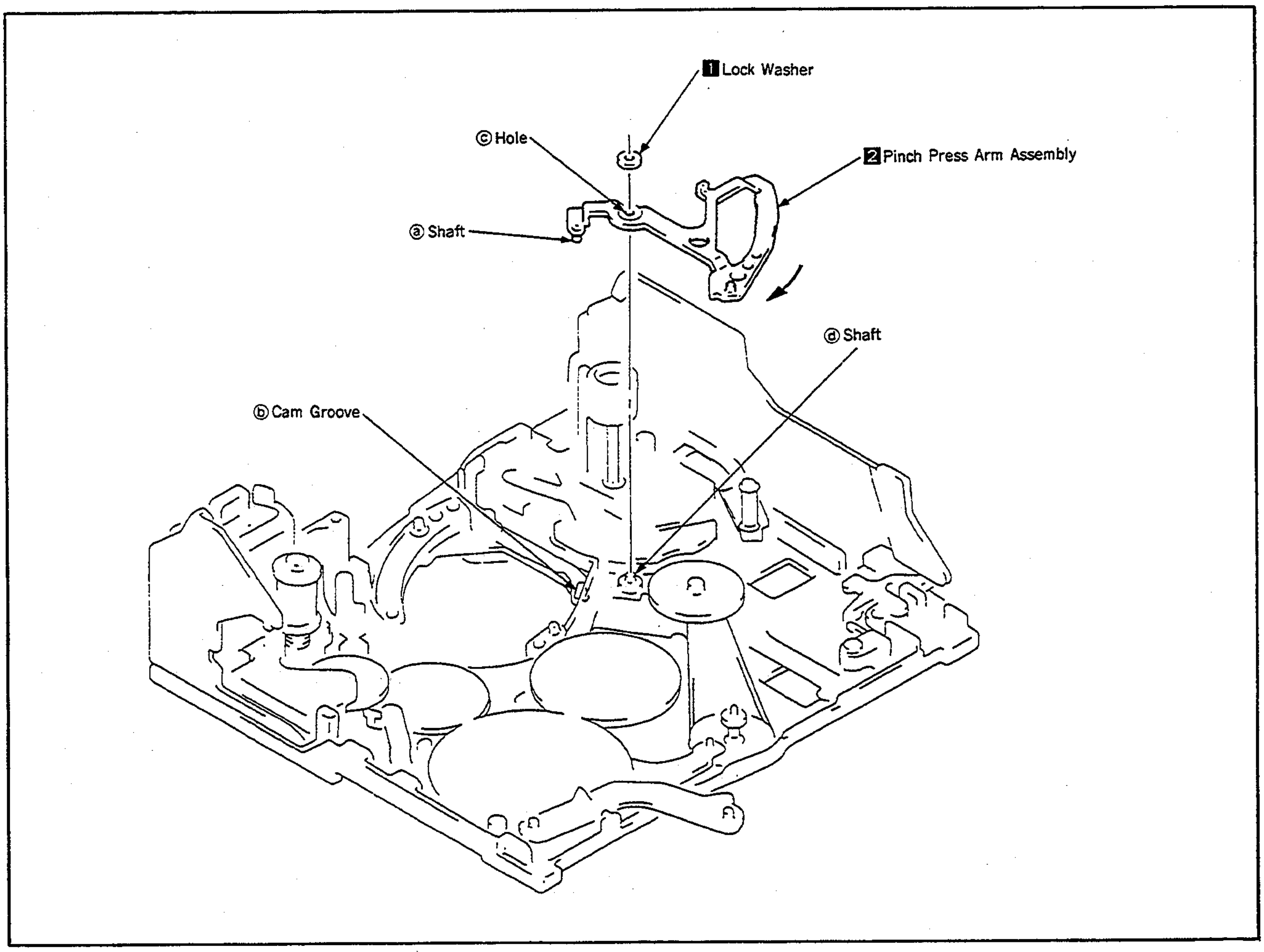


Fig. 24

7. CAM (Fig. 25)

Removal

Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove the cam **1**.

2. Mounting

1) Referring to 3-13, remove the LM motor assembly.

Note : Take care not to allow grease of LM motor assembly to stick to the TG-2 roller assembly.

2) Mount the cam **1**, aligning its center hole with shaft of mechanical chassis, and the cam groove with the shaft of GL arm assembly. At this time , make sure that the ▲ mark on L gear B is aligned with that on the cam and also a recess is aligned with the phase aligning hole respectively as shown in Fig. a.

Note : Apply grease to the cam groove if it scarecely remains.

3) Mount the LM motor assembly.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-14, mount the LS arm assembly.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

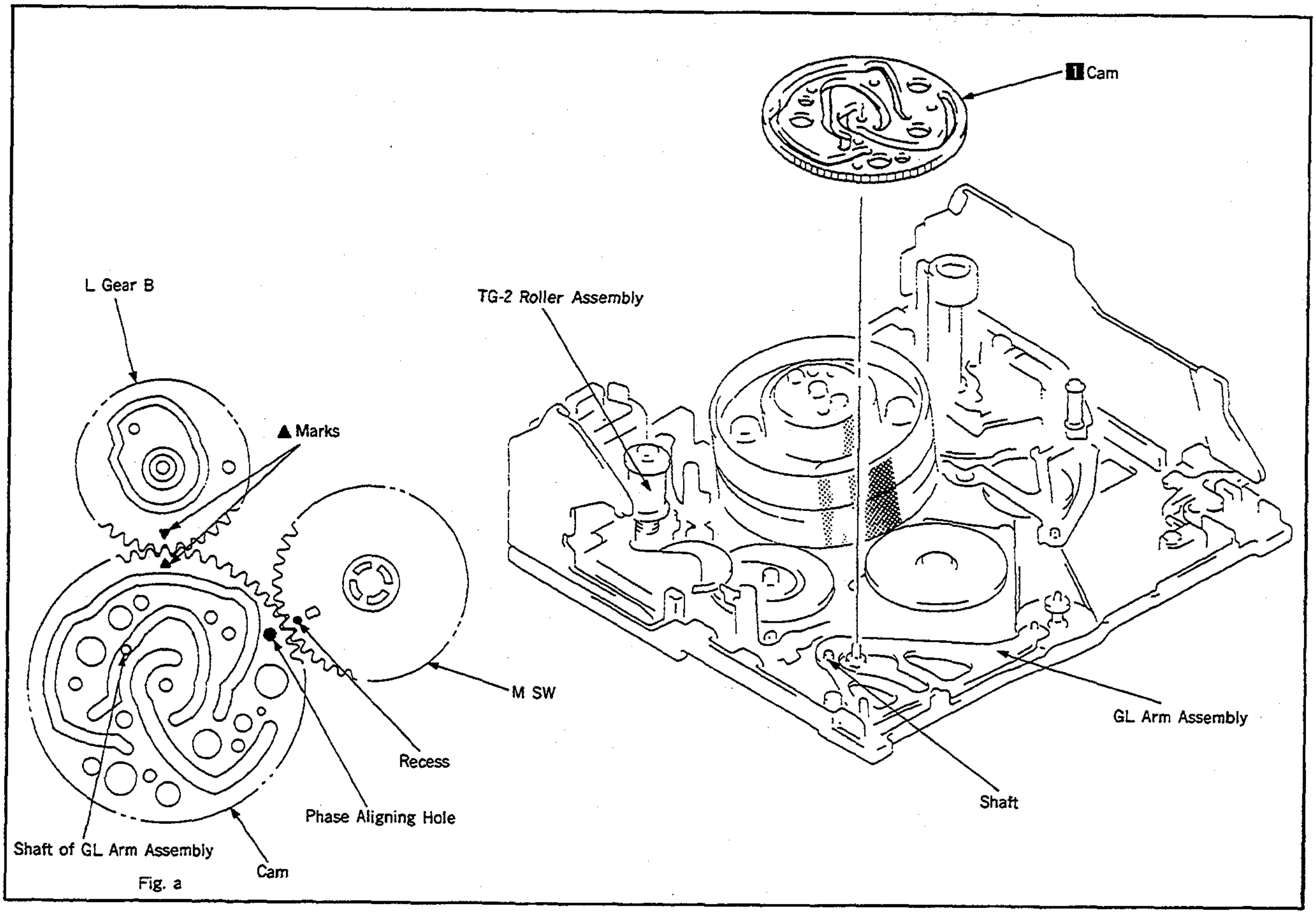


Fig. a

Fig. 25

3-18. GL ARM ASSEMBLY (Fig. 26)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Remove the GL arm assembly **1**.

2. Mounting

1) Mount the GL arm assembly **1** with its hole ⓐ inserted in the shaft ⓑ of mechanical chassis.
2) Referring to 3-17, mount the cam.
3) Referring to 3-15, mount the M slider assembly.
4) Referring to 3-14, mount the LS arm assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

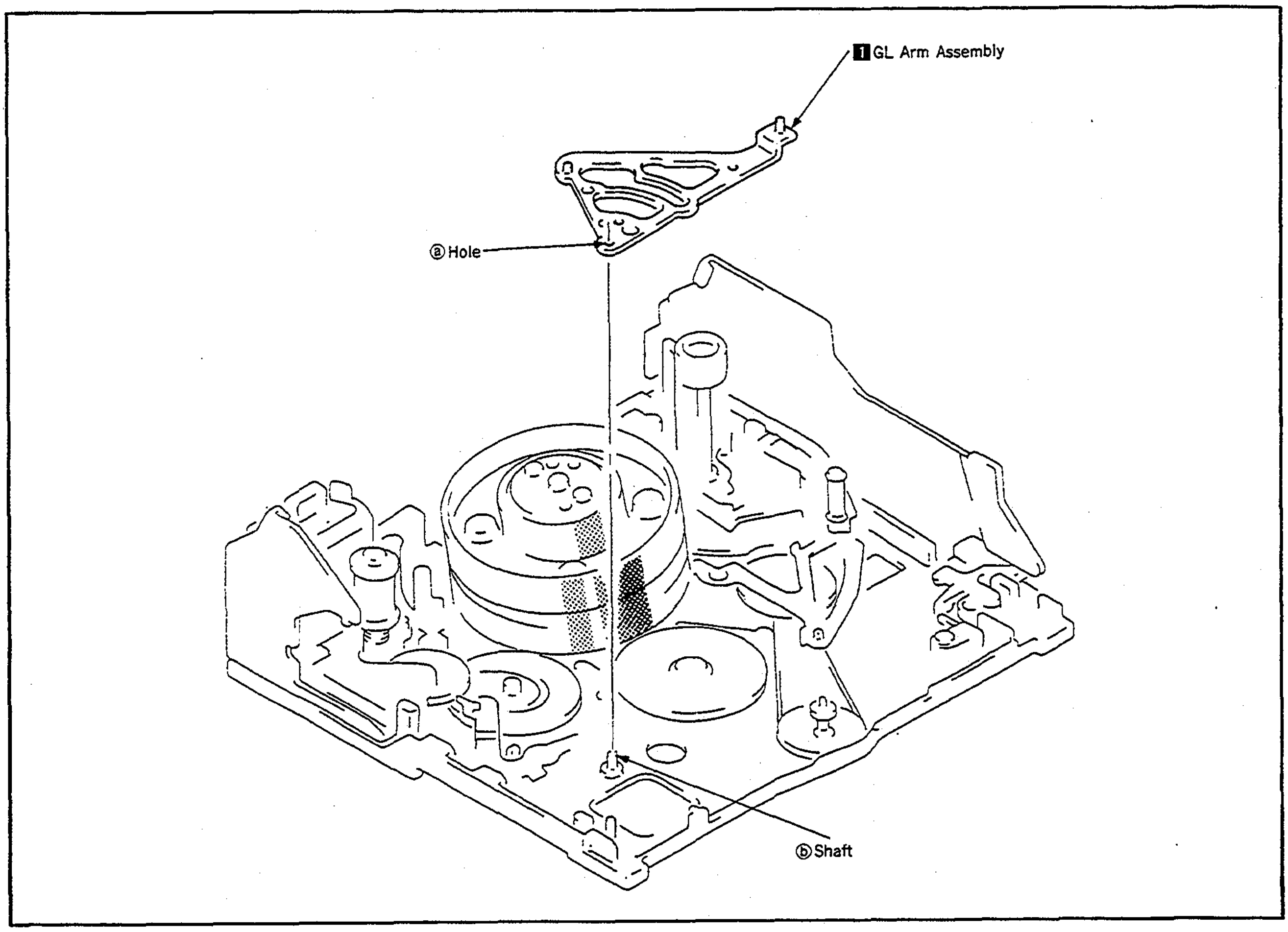


Fig. 26

9. L GEAR A AND L GEAR B (Fig. 27)

Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Referring to 3-13, remove the LM motor assembly.
9) Remove the FF arm assembly **1**.
10) Remove the L gear A **2**.
11) Remove the L gear B **3**.

2. Mounting

1) Insert the L gear B **3** into the shaft of mechanical chassis. (At this time, the phase aligning mark ▲ should be faced toward the cam mounting shaft ⓐ.)
2) Insert the L gear A **2** into the shaft of mechanical chassis.
3) Mount the FF arm assembly **1** with its two shafts inserted into the cam groove of L gear B **3** and the hole of mechanical chassis.
4) Referring to 3-17, mount the cam.
5) Referring to 3-13, mount the LM motor assembly.
6) Referring to 3-15, mount the M sleder assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-2, mount the protector base assembly.
10) Referring to 3-1, mount the Retainer, Gooseneck assembly.
11) Referring to 1-1, mount the cassette compartment assembly.

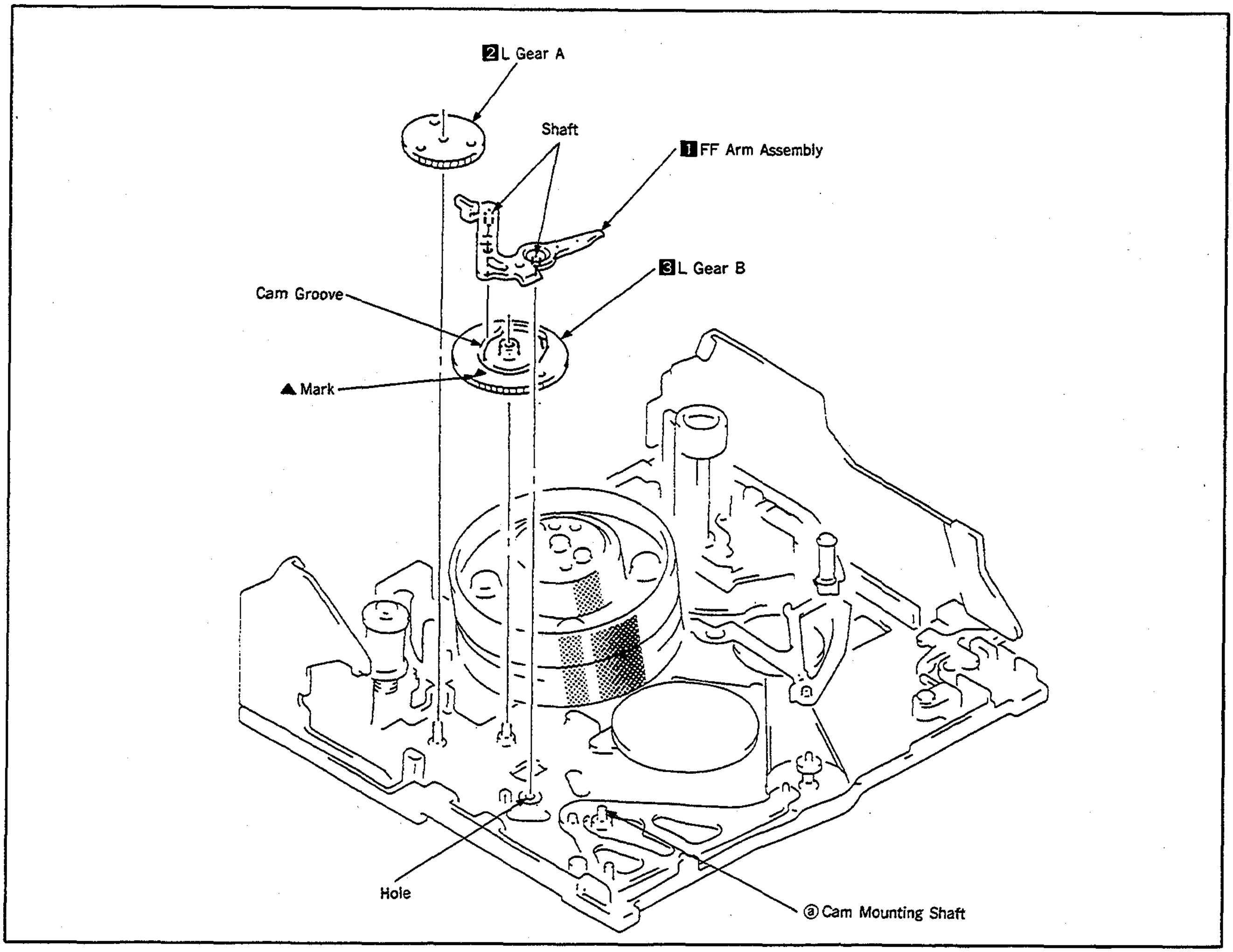


Fig. 27

3-20. RELAY PULLEY AND CHANGE GEAR ASSEMBLY (Fig. 28)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assembly.
6) Referring to 3-14, remove the LS arm assembly.
7) Referring to 3-15, remove the M slider assembly.
8) Referring to 3-17, remove the cam.
9) Referring to 3-18, remove the GL arm assembly.
10) Referring to 3-16, remove the pinch press arm assembly.
11) Remove a lock washer [1], then remove together the Change gear assembly [2], relay belt [3] and relay pulley [4].

2. Mounting

*Give one or two drips of oil to the conversion gear shaft and relay pulley shaft respectively. (Oiling range is under the neck as shown in Fig. a.)

1) Hooking the relay belt [3] to the relay pulley [4] and Change gear assembly [2], mount respective parts.
   *At first, insert the relay pulley into the mechanical chassis-shaft, then the change gear assembly by engaging with the capstan motor gear.

Note : Take care not to damage the Change gear by the capstan motor gear.

2) Mount a lock washer [1].
3) Referring to 3-16, mount the pinch press arm assembly.
4) Referring to 3-18, mount the GL arm asembly.
5) Referring to 3-17, mount the cam.
6) Referring to 3-15, mount the M slider assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-3, mount the drum assembly.
10) Referring to 3-2, mount the protector base assembly.
11) Referring to 3-1, mount the Retainer, Gooseneck assembly.
12) Referring to 1-1, mount the cassette compartment assembly.

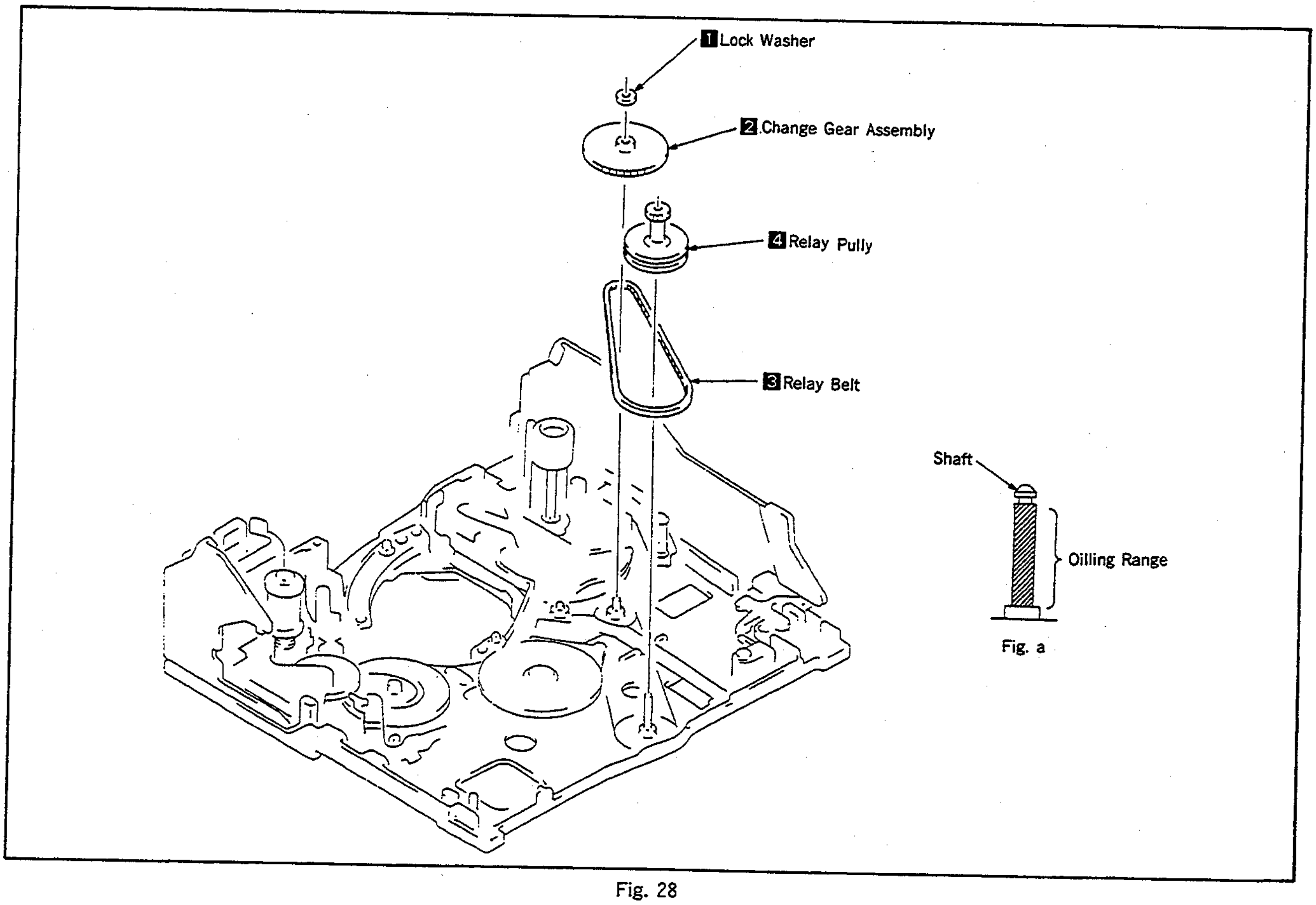


Fig. 28

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

- If possible, make a recording before removal.

1) Remove the two screws 1 (Fig. 29).
2) Mount the jig 2 (Ref. No. J-10) with the two supplied screws 3, then screw the attached hexagon socket screws 4 to the jig 2. The rotary upper drum 5 will move upward and come off (Fig. 30).

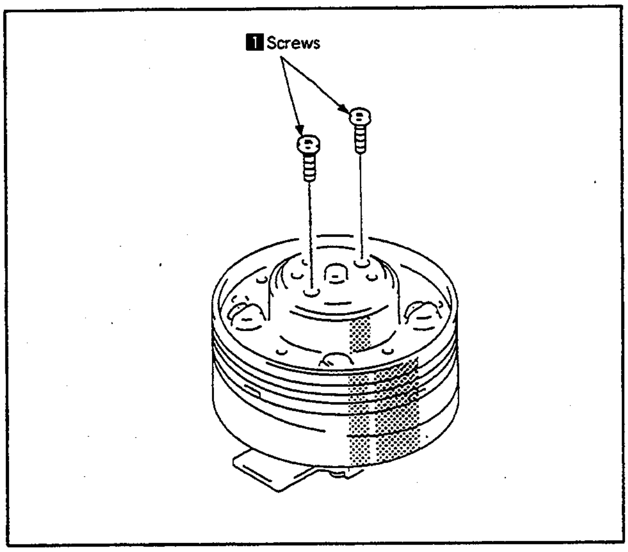


Fig. 29

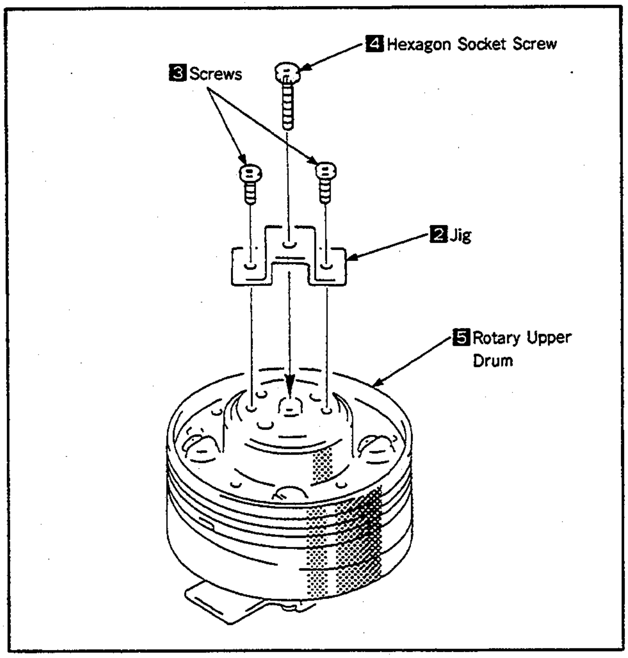


Fig. 30

2. Installation

1) Wipe clean the flange surface and the rotary upper drum 5 surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig 6 (Ref. No. J-10) into the drum positioining hole, then set then set the rotary upper drum 5 by passing the jig through its positioning hole 7. (Fig.31)
3) Remove the jig 6 and push down the rotary upper drum 5 gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws 1 alternately (Fig.29).
4) Insert the jig 6 into the positioning hole 7 again and confirm that it goes in smoothly. If it does not, loosen the two screws 1, repeat step 2) of the Removal paragraph and restart the setting procedure.
5) Tighten the screws 1.

Note : After installing, be sure to perform tape path adjustment as described in section 4.

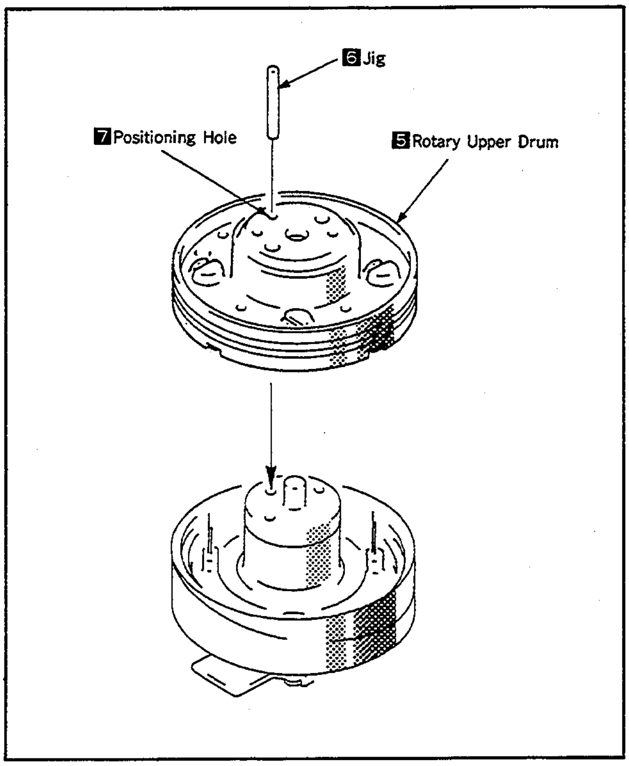


Fig. 31

3-22. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 32)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 4.2 mm.
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw ❶.
5) If No.1 guide is located inside the specified position, shift the string block toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-15). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw ❶.

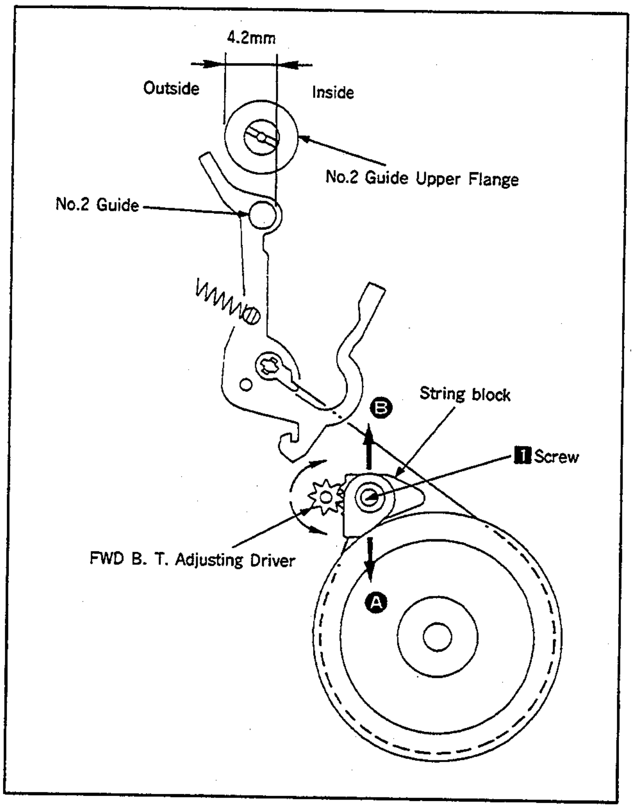

4.2mm
Outside
Inside
No.2 Guide Upper Flange
No.2 Guide
String block
Ⓑ
❶ Screw
FWD B. T. Adjusting Driver
Ⓐ

Fig. 32

3-23. FWD BACK TENSION ADJUSTMENT (Fig.33)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-17).
2) Set the torque cassette (Ref No.J-10).
3) Select the FWD mode, and check that the torque of S reel table is 8.5 ~ 11.5 g · cm.
   If it is out of standard, adjust the TG-1 spring hook position using the FWD B.T. adjusting driver (Ref No. J-15).

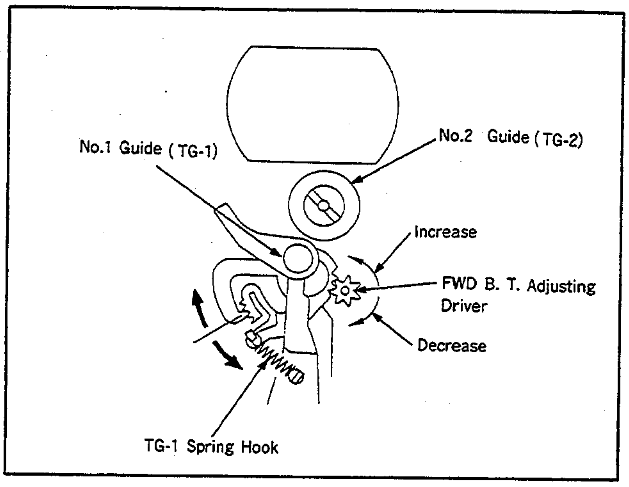

No.1 Guide (TG-1)
No.2 Guide (TG-2)
Increase
FWD B. T. Adjusting Driver
Decrease
TG-1 Spring Hook

Fig. 33

3-24. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuation center of T reel table is 7 ~ 17 g · cm
3) Select the REV mode, and check that the torque fluctuation center of S reel table is 25 ~ 39 g · cm.
4) Select the REV mode, and check that the torque of T reel table is 7 ~ 17 g · cm.
5) If the above data is not satisfied, the tension regulator band, T hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.
This does away a tracking control knob and allows accurate track tracing.
On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.
Therefore, in the A mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No.J-16). So, fine tracking adjustment can be easily done. Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

Example) For CCD-FX410 series
Set the adjusting remote controller to the HOLD ON side.

1) Set PAGE : 1, ADDRESS : 00, DATA : 01 to cancel the PROTECT mode.
2) Set PAGE : D, ADDRESS : 01, DATA : 03 to select the PATH mode.

Note : Setting of PATH mode = TRACK SHIFT mode
If the adjusting remote controller (Ref No.J-16) is set to HOLD OFF once, then set to HOLD ON again after mode setting, the display of ADDRESS and DATA changes.

3) After adjustment is over, set DATA : 00, and press the PAUSE buttom on the adjusting remote controller (Ref No. J-16).

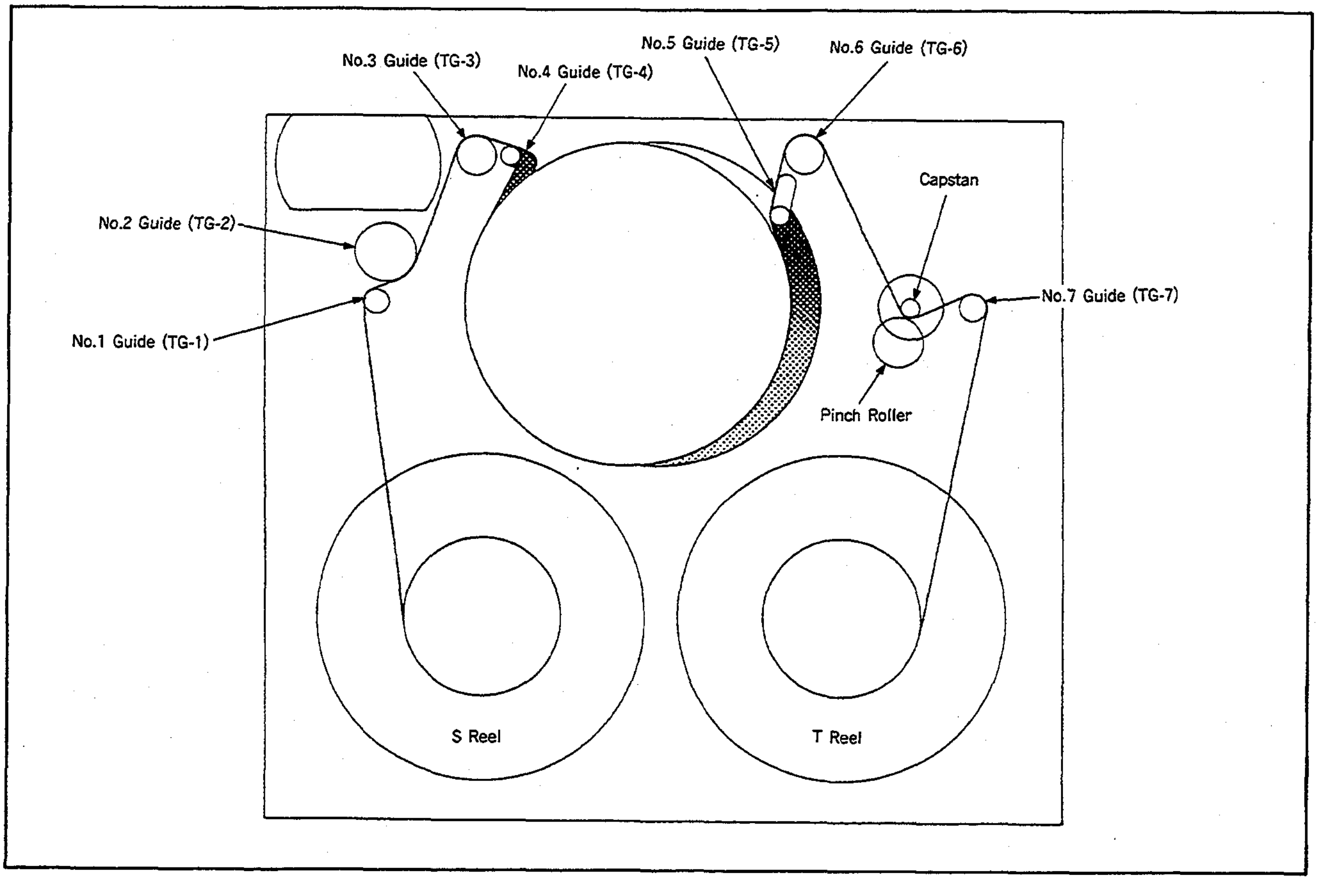


Fig. 34-A

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig.41).
Therefore, when performing section 4-4. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

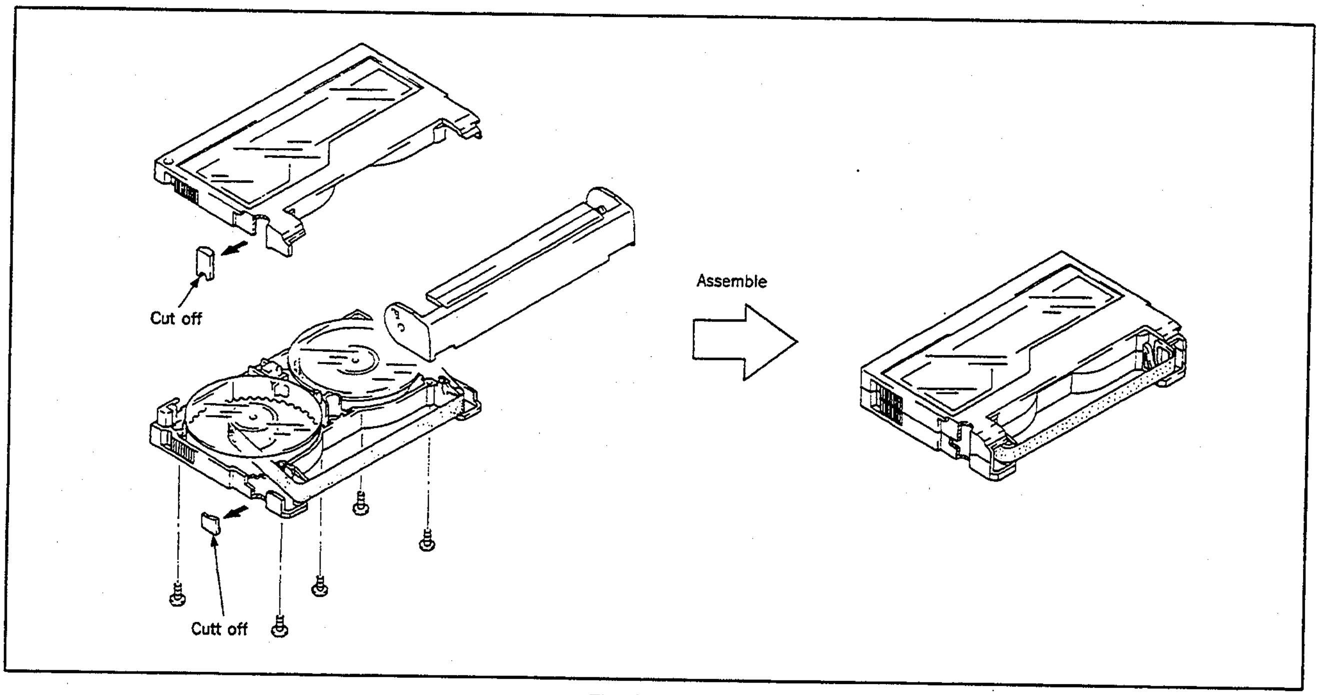


Fig. 34-B

4-1. PREPARATION FOR ADJUSTMENT

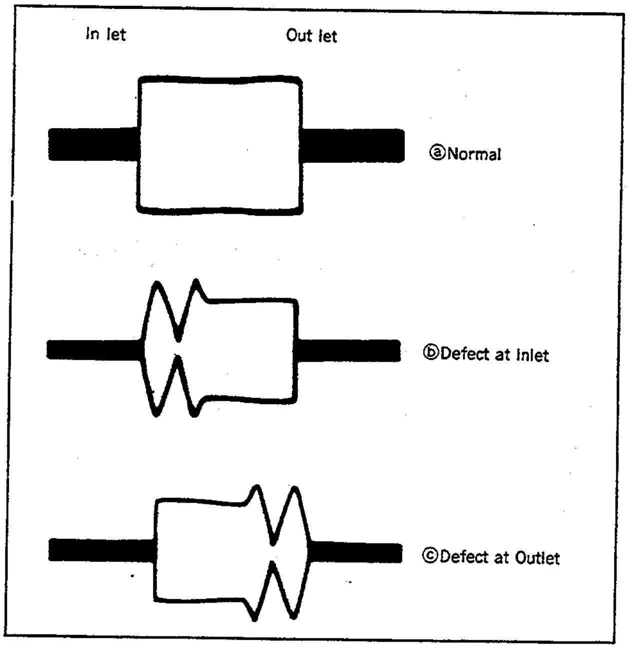


Fig. 35

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34-A).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
   Example) For CCD-FX410 series
   CH1 : CN001 pin ③ (PB RF OUT) on CS-31 board
   CH2 : CN001 pin ④ (RF SWP) on CS-31 board
4) Play back a tracking alignment tape (NTSC : WR5-1N, or PAL : WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 35 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 35 ⓑ and ⓒ.

4-2. TRACKING ADJUSTMENT (Fig. 36, 37)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG-3) lock screw ❶ and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG-3) lock screw ❶ to lock the No.3 guide.
4) Loosen the No.6 guide (TG-6) lock screw ❷ and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG-6) lock screw ❷ to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.
: Take care not to allow interference between No.6 guide and drum when tightening the No.6 guide lock screw.

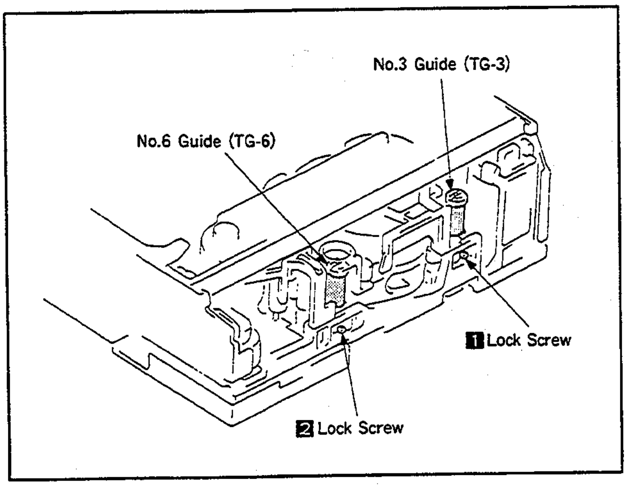


Fig. 36

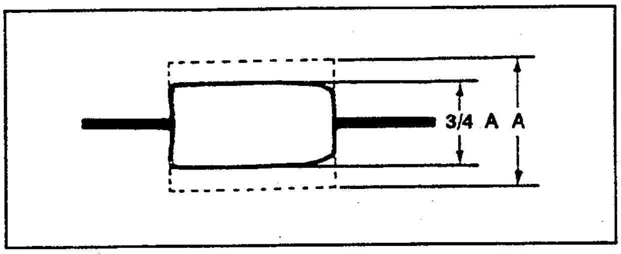


Fig. 37

4-3. No.2 GUIDE (TG-2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

4-3-1. No. 2 GUIDE (TG-2) HEIGHT PRESETTING (Fig. 38)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3.3 ± 0.05 mm.

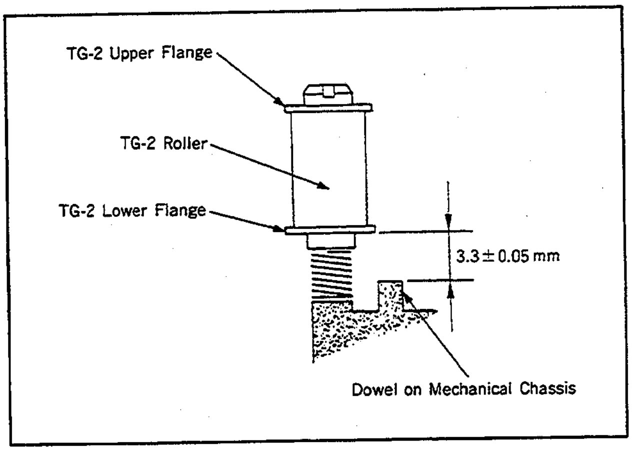


Fig. 38

[Reference]
This A mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-3-2. No. 2 GUIDE (TG-2) ADJUSTMENT (Fig. 39, 40)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange 2 of the No.2 guide (TG-2) 1 (Fig. 39). If it is, turn the upper flange 3 of the No.2 guide (TG-2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 4-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 40), turn the upper flange 3 of the No. 2 guide (TG-2) 1 90° counterclockwise and repeat step 5.

   Repeat steps 5) and 6) until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step 5).

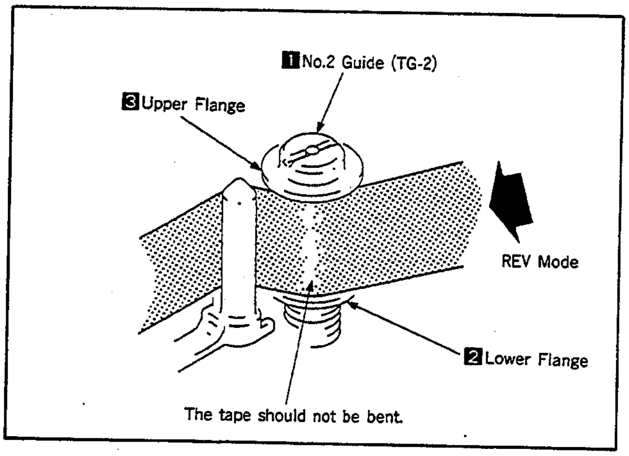


Fig. 39

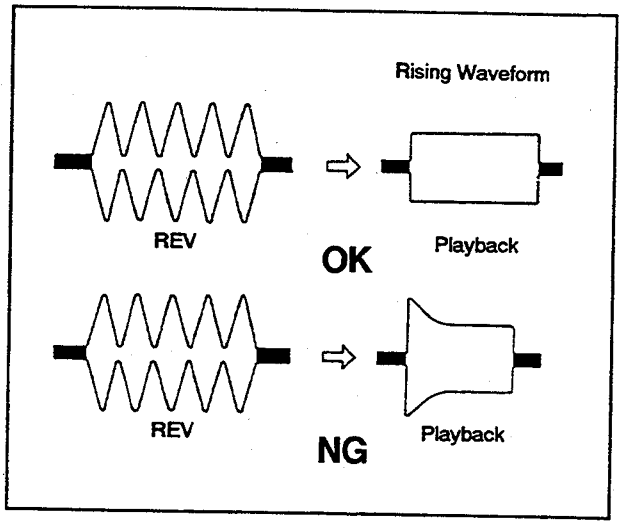


Fig. 40

4-4. No.7 GUIDE (TG-7) ADJUSTMENT (Fig. 41)

Note : This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 34-B).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG-6) 1 and the capstan 2. If it is, turn the hight adjusting screw 4 of the No.7 guide (TG-7) 3 until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan 2 and the hight adjusting screw 4 of the No.7 guide (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the No.7 guide (TG-7) 3 until bending is within the specification (0.5mm).

   If in the REV mode tape bending between the No. 6 guide (TG-6) 1 and the capstan 2 is 0.3mm or less, adjustment can be considered completed.

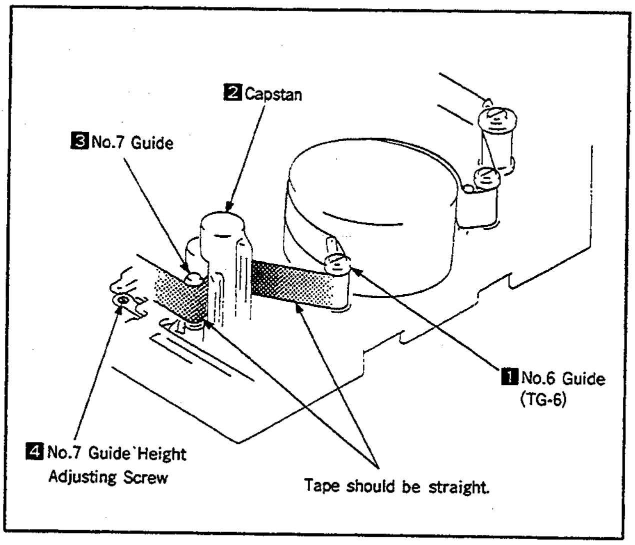


Fig. 41

4-5. CUE AND REV WAVEFORM CHECK (Fig. 42)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 42). In case pitch is not constant, perform section 4-2.Tracking Fine Adjustment and section 4-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig. 42). Otherwise, perform section 4-2 Tracking Fine Adjustment.

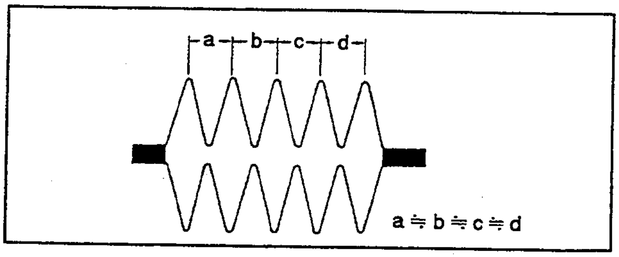


Fig. 42

4-6. CHECK AFTER ADJUSTMENT

4-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 43).
2) Then, confirm that the minimum amplitude value (EMIN) is 65 % of the maximum value (EMAX) or larger (Fig. 44).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

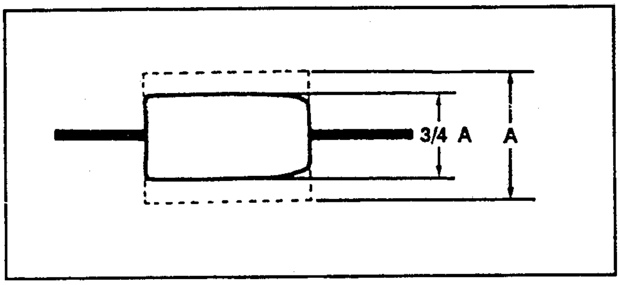


Fig. 43

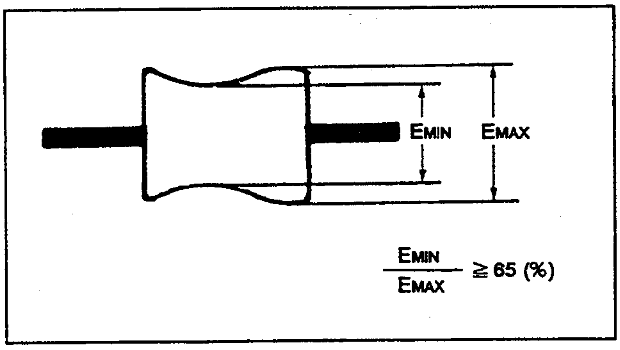

EMIN
EMAX
EMIN / EMAX ≧ 65 (%)

Fig. 44

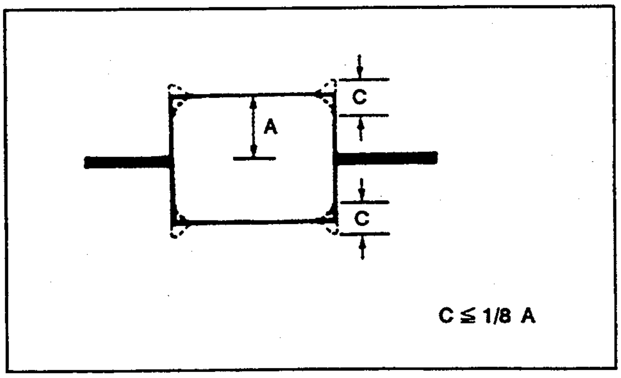


Fig. 45

4-6-2. RISING CHECK (Fig. 46)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

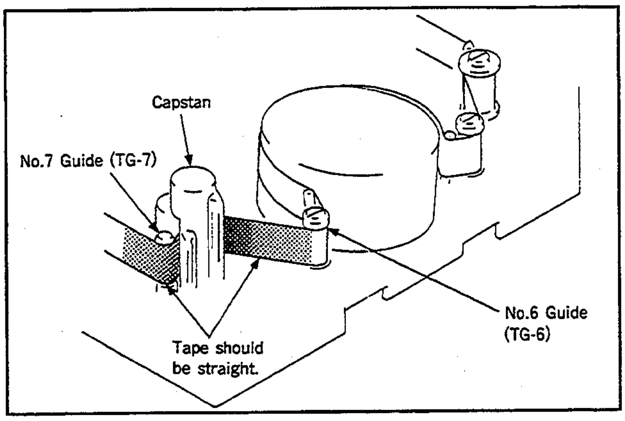

Capstan
No.7 Guide (TG-7)
No.6 Guide (TG-6)
Tape should be straight.

Fig. 46

4-6-3. TAPE PATH CHECK (Fig. 47)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

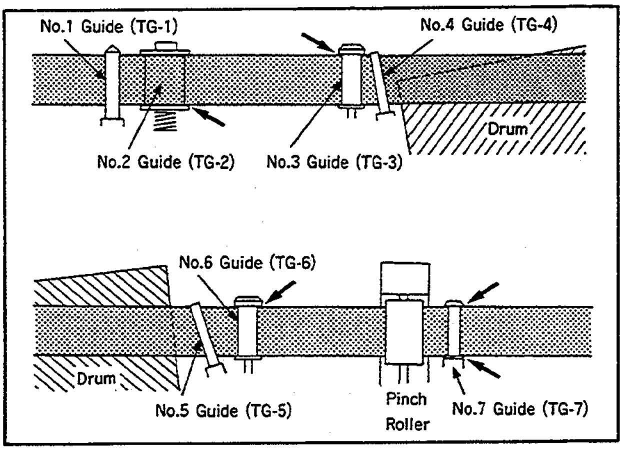

No.1 Guide (TG-1)
No.4 Guide (TG-4)
Drum
No.2 Guide (TG-2)
No.3 Guide (TG-3)
No.6 Guide (TG-6)
Drum
No.5 Guide (TG-5)
Pinch Roller
No.7 Guide (TG-7)

Fig. 47

8mm Video MECHANICAL ADJUSTMENT MANUAL IV

A MECHANISM

SUPPLIMENT-2

Video 8

〈Connection of Mode Selector IV Conversion Connector〉

In use of Mode selector IV conversion connector(J-6082-167-A), there are two different connecting methods depending on the model connected:

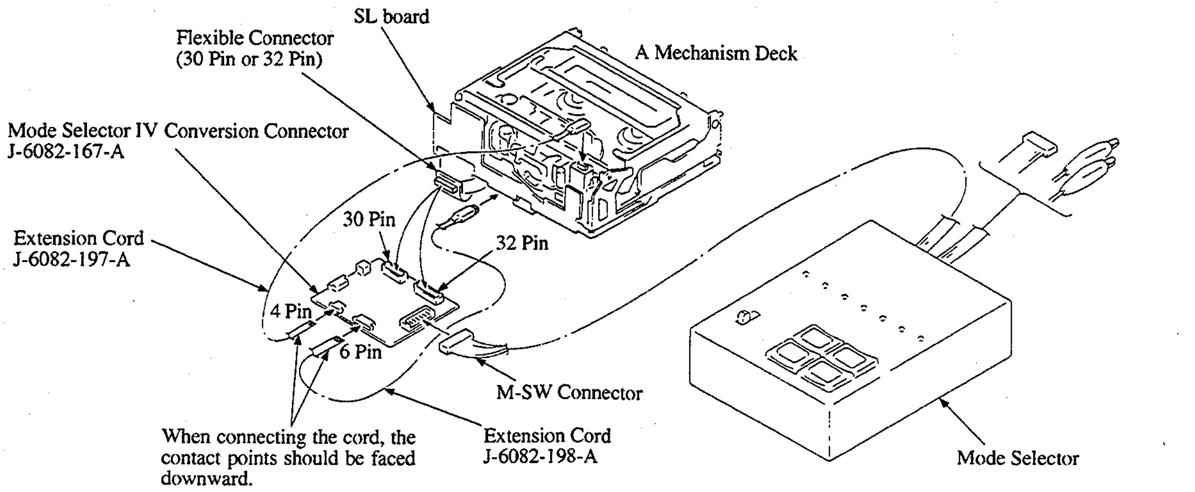
1. CCD-FX series

With the SL board mounted on mechanical deck, connect 30-pin(or 32-pin) connector to 30-pin(or 32-pin) Mode selector IV conversion connector.

CCD-FX300 series, FX400 series. FX500 series
→ 30-pin connector (FP425 or FP600)
CCD-FX700 series → 32-pin connector (FP477)

2. Models other than above

Connect the extension cord(J-6082-197-A) to loading motor 4-pin connector and extension cord (J-6082-198-A) to mode switch 6-pin connector in mechanical deck, then connect the other end of cord to 4-pin and 6-pin connectors of Mode selector IV conversion connector respectively, as shown below.


SL board
Flexible Connector
(30 Pin or 32 Pin)
A Mechanism Deck
Mode Selector IV Conversion Connector
J-6082-167-A
30 Pin
32 Pin
Extension Cord
J-6082-197-A
4 Pin
6 Pin
M-SW Connector
When connecting the cord, the contact points should be faced downward.
Extension Cord
J-6082-198-A
Mode Selector

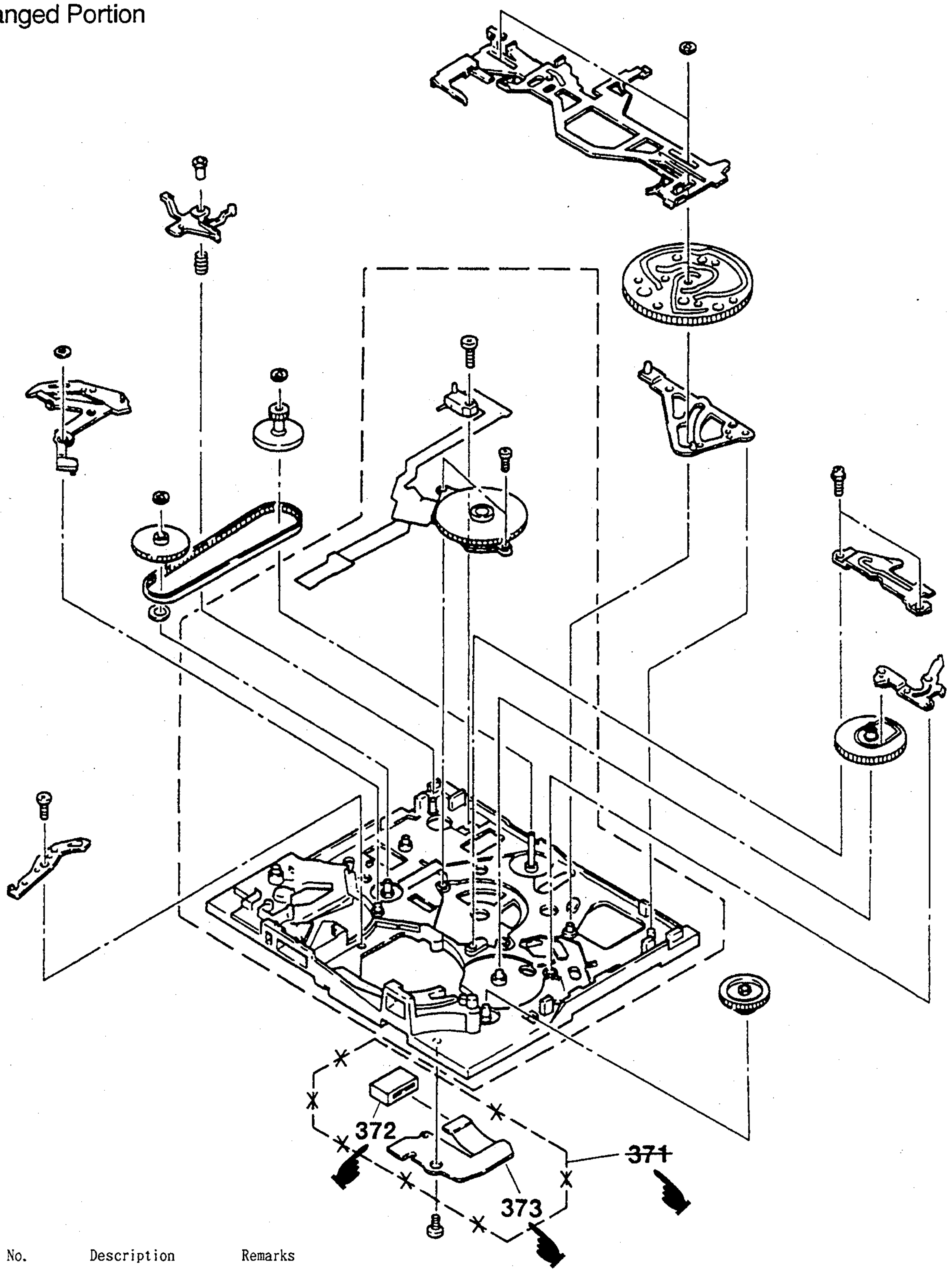
〈CORRECTION〉

P10. 2-4 Service jigs list

		Incorrect		Correct
J-15	FWD B.T adjusting driver	J-6082-182-A	➔	J-6082-187-A

MECHANISM CHASSIS ASSEMBLY (2)

☛ : Changed Portion



Ref.No.	Part No.	Description	Remarks
~~371~~	~~A-7040-311-A~~	~~FP-444 ASSY~~	☛
372	1-691-254-13	CONNECTOR, TRANSLATION 10P	☛
373	1-641-639-13	FP-442 FLEXIBLE BOARD	☛

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Personal Video Group

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